

| M | F  | X     | Y    | S    | Negative | Cout | Overflow | Zero | Gout | Pout | Comment   | Purpose                          | M | F | X    | Y     | S    | Negative | Cout | Overflow | Zero | Gout | Pout | Comment   | Purpose                          |                               |   |
|---|----|-------|------|------|----------|------|----------|------|------|------|-----------|----------------------------------|---|---|------|-------|------|----------|------|----------|------|------|------|-----------|----------------------------------|-------------------------------|---|
| 1 | 1  | -86   | 85   | -1   |          |      |          |      |      |      | X nand Y  | test nand                        | 1 | 1 | -86  | 85    | -1   |          |      |          |      |      |      | X nand Y  | test nand                        |                               |   |
| 1 | 0  | -86   | 85   | 0    |          |      |          |      |      |      | X and Y   | test and                         | 1 | 0 | -86  | 85    | 0    |          |      |          |      |      |      | X and Y   | test and                         |                               |   |
| 1 | 1  | -86   | 85   | -1   |          |      |          |      |      |      | X nand Y  | test nand                        | 1 | 1 | -86  | 85    | -1   |          |      |          |      |      |      | X nand Y  | test nand                        |                               |   |
| 1 | 2  | -86   | 85   | -1   |          |      |          |      |      |      | X or Y    | test or                          | 1 | 2 | -86  | 85    | -1   |          |      |          |      |      |      | X or Y    | test or                          |                               |   |
| 1 | 3  | -86   | 85   | 0    |          |      |          |      |      |      | X nor Y   | test nor                         | 1 | 3 | -86  | 85    | 0    |          |      |          |      |      |      | X nor Y   | test nor                         |                               |   |
| 1 | 4  | -86   | 85   | -1   |          |      |          |      |      |      | X xor Y   | test xor                         | 1 | 4 | -86  | 85    | -1   |          |      |          |      |      |      | X xor Y   | test xor                         |                               |   |
| 1 | 5  | -86   | 85   | 0    |          |      |          |      |      |      | X xnor Y  | test xnor                        | 1 | 5 | -86  | 85    | 0    |          |      |          |      |      |      | X xnor Y  | test xnor                        |                               |   |
| 1 | 6  | -86   | 85   | -86  | 1        |      |          | 0    |      |      | X         | test X                           | 1 | 6 | -86  | 85    | -86  | 1        |      |          | 0    |      |      | X         | test X                           |                               |   |
| 1 | 7  | -86   | -86  | -86  | 1        |      |          | 0    |      |      | Y         | test Y                           | 1 | 7 | -86  | -86   | -86  | 1        |      |          | 0    |      |      | Y         | test Y                           |                               |   |
| 0 | 0  | 14    | -14  | 0    | 0        | 1    | 0        | 1    | 1    | 0    | X plus Y  | test Z for addition              | 0 | 0 | 14   | -14   | 0    | 0        | 1    | 0        | 0    | 1    | 1    | 0         | X plus Y                         | test Z for addition           |   |
| 0 | 0  | 14    | -15  | -1   | 1        | 0    | 0        | 0    | 0    | 0    | X plus Y  | test N for addition              | 0 | 0 | 14   | -15   | -1   | 1        | 0    | 0        | 0    | 0    | 0    | 1         | X plus Y                         | test N for addition           |   |
| 0 | 0  | 14    | 127  | -115 | 1        | 0    | 1        | 0    | 0    | 0    | X plus Y  | test V upwards for addition      | 0 | 0 | 14   | 127   | -115 | 1        | 0    | 1        | 0    | 0    | 0    | 0         | X plus Y                         | test V upwards for addition   |   |
| 0 | 0  | -14   | -127 | 115  | 0        | 1    | 1        | 0    | 1    | 0    | X plus Y  | test V downwards for addition    | 0 | 0 | -14  | -127  | 115  | 0        | 1    | 1        | 0    | 1    | 0    | 0         | X plus Y                         | test V downwards for addition |   |
| 0 | 1  | 14    | 14   | 0    | 0        | 1    | 0        | 1    |      |      | X minus Y | test Z for subtraction           | 0 | 1 | 14   | 14    | 0    | 0        | 1    | 0        | 1    |      |      | X minus Y | test Z for subtraction           |                               |   |
| 0 | 1  | 14    | 15   | -1   | 1        | 0    | 0        | 0    |      |      | X minus Y | test N for subtraction           | 0 | 1 | 14   | 15    | -1   | 1        | 0    | 0        | 0    |      |      | X minus Y | test N for subtraction           |                               |   |
| 0 | 1  | 14    | -127 | -115 | 1        | 0    | 1        | 0    |      |      | X minus Y | test V upwards for subtraction   | 0 | 1 | 14   | -127  | -115 | 1        | 0    | 1        | 0    |      |      | X minus Y | test V upwards for subtraction   |                               |   |
| 0 | 1  | -14   | 127  | 115  | 0        | 1    | 1        | 0    |      |      | X minus Y | test V downwards for subtraction | 0 | 1 | -14  | 127   | 115  | 0        | 1    | 1        | 0    |      |      | X minus Y | test V downwards for subtraction |                               |   |
| 0 | 2  | 127   | 127  | -128 | 1        | 0    | 1        | 0    | 0    | 0    | X plus 1  | test V upwards for increment     | 0 | 2 | 127  | 127   | -128 | 1        | 0    | 1        | 0    | 0    | 0    | X plus 1  | test V upwards for increment     |                               |   |
| 0 | 3  | -128  | 127  | 127  | 0        | 1    | 1        | 0    |      |      | X minus 1 | test V downwards for decrement   | 0 | 3 | -128 | 127   | 127  | 0        | 1    | 1        | 0    |      |      | X minus 1 | test V downwards for decrement   |                               |   |
| 0 | 4  | 127   | 127  | -2   | 1        | 0    | 1        | 0    | 0    | 0    | X plus X  | test V upwards for doubling      | 0 | 4 | 127  | 127   | -2   | 1        | 0    | 1        | 0    | 0    | 0    | X plus X  | test V upwards for doubling      |                               |   |
| 0 | 4  | -128  | 127  | 0    | 0        | 1    | 1        | 1    | 1    | 0    | X plus X  | test V downwards for doubling    | 0 | 4 | -128 | 127   | 0    | 0        | 1    | 1        | 1    | 1    | 0    | X plus X  | test V downwards for doubling    |                               |   |
| 0 | 5  | -128  | 127  | -1   | 1        | 1    |          |      |      |      | minus 1   | test N C for -1                  | 0 | 5 | -128 | 127   | -1   | 1        | 1    |          |      |      |      | minus 1   | test N C for -1                  |                               |   |
| 0 | 6  | -128  | 127  | 0    |          |      |          |      |      |      | N/A       | test invalid operation           | 0 | 6 | -128 | 127   | 0    |          |      |          |      |      |      | N/A       | test invalid operation           |                               |   |
| 0 | 7  | -128  | 127  | 0    |          |      |          |      |      |      | N/A       | test invalid operation           | 0 | 7 | -128 | 127   | 0    |          |      |          |      |      |      | N/A       | test invalid operation           |                               |   |
| 9 | 64 | -1104 | 1483 | -182 | 9        | 7    | 8        | 3    | 3    | 1    | 0         |                                  | 0 | 9 | 64   | -1104 | 1483 | -182     | 9    | 7        | 8    | 3    | 3    | 1         | 0                                |                               | 0 |

| M | F  | X     | Y    | S    | Negative | Cout | Overflow | Zero | Gout | Pout | Comment   | Purpose                          | M | F | X    | Y     | S    | Negative | Cout | Overflow | Zero | Gout | Pout | Comment   | Purpose                          |   |
|---|----|-------|------|------|----------|------|----------|------|------|------|-----------|----------------------------------|---|---|------|-------|------|----------|------|----------|------|------|------|-----------|----------------------------------|---|
| 1 | 1  | -86   | 85   | -1   |          |      |          |      |      |      | X nand Y  | test nand                        | 1 | 1 | -86  | 85    | -1   |          |      |          |      |      |      | X nand Y  | test nand                        |   |
| 1 | 0  | -86   | 85   | 0    |          |      |          |      |      |      | X and Y   | test and                         | 1 | 0 | -86  | 85    | 0    |          |      |          |      |      |      | X and Y   | test and                         |   |
| 1 | 1  | -86   | 85   | -1   |          |      |          |      |      |      | X nand Y  | test nand                        | 1 | 1 | -86  | 85    | -1   |          |      |          |      |      |      | X nand Y  | test nand                        |   |
| 1 | 2  | -86   | 85   | -1   |          |      |          |      |      |      | X or Y    | test or                          | 1 | 2 | -86  | 85    | -1   |          |      |          |      |      |      | X or Y    | test or                          |   |
| 1 | 3  | -86   | 85   | 0    |          |      |          |      |      |      | X nor Y   | test nor                         | 1 | 3 | -86  | 85    | 0    |          |      |          |      |      |      | X nor Y   | test nor                         |   |
| 1 | 4  | -86   | 85   | -1   |          |      |          |      |      |      | X xor Y   | test xor                         | 1 | 4 | -86  | 85    | -1   |          |      |          |      |      |      | X xor Y   | test xor                         |   |
| 1 | 5  | -86   | 85   | 0    |          |      |          |      |      |      | X xnor Y  | test xnor                        | 1 | 5 | -86  | 85    | 0    |          |      |          |      |      |      | X xnor Y  | test xnor                        |   |
| 1 | 6  | -86   | 85   | -86  | 1        |      |          | 0    |      |      | X         | test X                           | 1 | 6 | -86  | 85    | -86  | 1        |      |          |      | 0    |      | X         | test X                           |   |
| 1 | 7  | -86   | -86  | -86  | 0        |      |          | 0    |      |      | Y         | test Y                           | 1 | 7 | -86  | -86   | -86  | 1        |      |          |      | 0    |      | Y         | test Y                           |   |
| 0 | 0  | 14    | -14  | 0    | 0        | 1    | 0        | 1    | 1    | 0    | X plus Y  | test Z for addition              | 0 | 0 | 14   | -14   | 0    | 0        | 1    | 0        | 1    | 1    | 0    | X plus Y  | test Z for addition              |   |
| 0 | 0  | 14    | -15  | -1   | 1        | 0    | 0        | 0    | 0    | 1    | X plus Y  | test N for addition              | 0 | 0 | 14   | -15   | -1   | 1        | 0    | 0        | 0    | 0    | 1    | X plus Y  | test N for addition              |   |
| 0 | 0  | 14    | 127  | -115 | 1        | 0    | 1        | 0    | 0    | 0    | X plus Y  | test V upwards for addition      | 0 | 0 | 14   | 127   | -115 | 1        | 0    | 1        | 0    | 0    | 0    | X plus Y  | test V upwards for addition      |   |
| 0 | 0  | -14   | -127 | 115  | 0        | 1    | 1        | 0    | 1    | 0    | X plus Y  | test V downwards for addition    | 0 | 0 | -14  | -127  | 115  | 0        | 1    | 1        | 0    | 1    | 0    | X plus Y  | test V downwards for addition    |   |
| 0 | 1  | 14    | 14   | 0    | 0        | 1    | 0        | 1    |      |      | X minus Y | test Z for subtraction           | 0 | 1 | 14   | 14    | 0    | 0        | 1    | 0        | 1    |      |      | X minus Y | test Z for subtraction           |   |
| 0 | 1  | 14    | 15   | -1   | 1        | 0    | 0        | 0    |      |      | X minus Y | test N for subtraction           | 0 | 1 | 14   | 15    | -1   | 1        | 0    | 0        | 0    |      |      | X minus Y | test N for subtraction           |   |
| 0 | 1  | 14    | -127 | -115 | 1        | 0    | 1        | 0    |      |      | X minus Y | test V upwards for subtraction   | 0 | 1 | 14   | -127  | -115 | 1        | 0    | 1        | 0    |      |      | X minus Y | test V upwards for subtraction   |   |
| 0 | 1  | -14   | 127  | 115  | 0        | 1    | 1        | 0    |      |      | X minus Y | test V downwards for subtraction | 0 | 1 | -14  | 127   | 115  | 0        | 1    | 1        | 0    |      |      | X minus Y | test V downwards for subtraction |   |
| 0 | 2  | 127   | 127  | -128 | 1        | 0    | 1        | 0    | 0    | 0    | X plus 1  | test V upwards for increment     | 0 | 2 | 127  | 127   | -128 | 1        | 0    | 1        | 0    | 0    | 0    | X plus 1  | test V upwards for increment     |   |
| 0 | 3  | -128  | 127  | 127  | 0        | 1    | 1        | 0    |      |      | X minus 1 | test V downwards for decrement   | 0 | 3 | -128 | 127   | 127  | 0        | 1    | 1        | 0    |      |      | X minus 1 | test V downwards for decrement   |   |
| 0 | 4  | 127   | 127  | -2   | 1        | 0    | 1        | 0    | 0    | 0    | X plus X  | test V upwards for doubling      | 0 | 4 | 127  | 127   | -2   | 1        | 0    | 1        | 0    | 0    | 0    | X plus X  | test V upwards for doubling      |   |
| 0 | 4  | -128  | 127  | 0    | 0        | 1    | 1        | 1    | 1    | 0    | X plus X  | test V downwards for doubling    | 0 | 4 | -128 | 127   | 0    | 0        | 1    | 1        | 1    | 1    | 0    | X plus X  | test V downwards for doubling    |   |
| 0 | 5  | -128  | 127  | -1   | 0        | 1    |          |      |      |      | minus 1   | test N C for -1                  | 0 | 5 | -128 | 127   | -1   | 1        | 1    |          |      |      |      | minus 1   | test N C for -1                  |   |
| 0 | 6  | -128  | 127  | 0    |          |      |          |      |      |      | N/A       | test invalid operation           | 0 | 6 | -128 | 127   | 0    |          |      |          |      |      |      | N/A       | test invalid operation           |   |
| 0 | 7  | -128  | 127  | 0    |          |      |          |      |      |      | N/A       | test invalid operation           | 0 | 7 | -128 | 127   | 0    |          |      |          |      |      |      | N/A       | test invalid operation           |   |
| 9 | 64 | -1104 | 1483 | -182 | 7        | 7    | 8        | 3    | 3    | 1    | 0         |                                  | 0 | 9 | 64   | -1104 | 1483 | -182     | 9    | 7        | 8    | 3    | 3    | 1         | 0                                | 0 |

| M | F  | X     | Y    | S    | Negative | Cout | Overflow | Zero | Gout | Pout | Comment   | Purpose                          | M | F | X    | Y     | S    | Negative | Cout | Overflow | Zero | Gout | Pout | Comment   | Purpose                          |  |
|---|----|-------|------|------|----------|------|----------|------|------|------|-----------|----------------------------------|---|---|------|-------|------|----------|------|----------|------|------|------|-----------|----------------------------------|--|
| 1 | 1  | -86   | 85   | -1   |          |      |          |      |      |      | X nand Y  | test nand                        | 1 | 1 | -86  | 85    | -1   |          |      |          |      |      |      | X nand Y  | test nand                        |  |
| 1 | 0  | -86   | 85   | 0    |          |      |          |      |      |      | X and Y   | test and                         | 1 | 0 | -86  | 85    | 0    |          |      |          |      |      |      | X and Y   | test and                         |  |
| 1 | 1  | -86   | 85   | -1   |          |      |          |      |      |      | X nand Y  | test nand                        | 1 | 1 | -86  | 85    | -1   |          |      |          |      |      |      | X nand Y  | test nand                        |  |
| 1 | 2  | -86   | 85   | -1   |          |      |          |      |      |      | X or Y    | test or                          | 1 | 2 | -86  | 85    | -1   |          |      |          |      |      |      | X or Y    | test or                          |  |
| 1 | 3  | -86   | 85   | 0    |          |      |          |      |      |      | X nor Y   | test nor                         | 1 | 3 | -86  | 85    | 0    |          |      |          |      |      |      | X nor Y   | test nor                         |  |
| 1 | 4  | -86   | 85   | -1   |          |      |          |      |      |      | X xor Y   | test xor                         | 1 | 4 | -86  | 85    | -1   |          |      |          |      |      |      | X xor Y   | test xor                         |  |
| 1 | 5  | -86   | 85   | 0    |          |      |          |      |      |      | X xnor Y  | test xnor                        | 1 | 5 | -86  | 85    | 0    |          |      |          |      |      |      | X xnor Y  | test xnor                        |  |
| 1 | 6  | -86   | 85   | -86  | 1        |      |          | 0    |      |      | X         | test X                           | 1 | 6 | -86  | 85    | -86  |          |      |          | 0    |      |      | X         | test X                           |  |
| 1 | 7  | -86   | -86  | -86  | 1        |      |          | 0    |      |      | Y         | test Y                           | 1 | 7 | -86  | -86   | -86  | 1        |      |          | 0    |      |      | Y         | test Y                           |  |
| 0 | 0  | 14    | -14  | 0    | 0        | 1    | 0        | 1    | 1    | 0    | X plus Y  | test Z for addition              | 0 | 0 | 14   | -14   | 0    | 0        | 1    | 0        | 1    | 1    | 0    | X plus Y  | test Z for addition              |  |
| 0 | 0  | 14    | -15  | -1   | 1        | 0    | 0        | 0    | U    | 1    | X plus Y  | test N for addition              | 0 | 0 | 14   | -15   | -1   | 1        | 0    | 0        | 0    | 0    | 1    | X plus Y  | test N for addition              |  |
| 0 | 0  | 14    | 127  | -115 | 1        | 0    | 1        | 0    | U    | 0    | X plus Y  | test V upwards for addition      | 0 | 0 | 14   | 127   | -115 | 1        | 0    | 1        | 0    | 0    | 0    | X plus Y  | test V upwards for addition      |  |
| 0 | 0  | -14   | -127 | 115  | 0        | 1    | 1        | 0    | 1    | 0    | X plus Y  | test V downwards for addition    | 0 | 0 | -14  | -127  | 115  | 0        | 1    | 1        | 0    | 1    | 0    | X plus Y  | test V downwards for addition    |  |
| 0 | 1  | 14    | 14   | 0    | 0        | 1    | 0        | 1    |      |      | X minus Y | test Z for subtraction           | 0 | 1 | 14   | 14    | 0    | 0        | 1    | 0        | 1    |      |      | X minus Y | test Z for subtraction           |  |
| 0 | 1  | 14    | 15   | -1   | 1        | 0    | 0        | 0    |      |      | X minus Y | test N for subtraction           | 0 | 1 | 14   | 15    | -1   | 1        | 0    | 0        | 0    |      |      | X minus Y | test N for subtraction           |  |
| 0 | 1  | 14    | -127 | -115 | 1        | 0    | 1        | 0    |      |      | X minus Y | test V upwards for subtraction   | 0 | 1 | 14   | -127  | -115 | 1        | 0    | 1        | 0    |      |      | X minus Y | test V upwards for subtraction   |  |
| 0 | 1  | -14   | 127  | 115  | 0        | 1    | 1        | 0    |      |      | X minus Y | test V downwards for subtraction | 0 | 1 | -14  | 127   | 115  | 0        | 1    | 1        | 0    |      |      | X minus Y | test V downwards for subtraction |  |
| 0 | 2  | 127   | 127  | -128 | 1        | 0    | 1        | 0    | U    | 0    | X plus 1  | test V upwards for increment     | 0 | 2 | 127  | 127   | -128 | 1        | 0    | 1        | 0    | 0    | 0    | X plus 1  | test V upwards for increment     |  |
| 0 | 3  | -128  | 127  | 127  | 0        | 1    | 1        | 0    |      |      | X minus 1 | test V downwards for decrement   | 0 | 3 | -128 | 127   | 127  | 0        | 1    | 1        | 0    |      |      | X minus 1 | test V downwards for decrement   |  |
| 0 | 4  | 127   | 127  | -2   | 1        | 0    | 1        | 0    | U    | 0    | X plus X  | test V upwards for doubling      | 0 | 4 | 127  | 127   | -2   | 1        | 0    | 1        | 0    | 0    | 0    | X plus X  | test V upwards for doubling      |  |
| 0 | 4  | -128  | 127  | 0    | 0        | 1    | 1        | 1    | 1    | 0    | X plus X  | test V downwards for doubling    | 0 | 4 | -128 | 127   | 0    | 0        | 1    | 1        | 1    | 1    | 0    | X plus X  | test V downwards for doubling    |  |
| 0 | 5  | -128  | 127  | -1   | 1        | 1    |          |      |      |      | minus 1   | test N C for -1                  | 0 | 5 | -128 | 127   | -1   | 1        | 1    |          |      |      |      | minus 1   | test N C for -1                  |  |
| 0 | 6  | -128  | 127  | 0    |          |      |          |      |      |      | N/A       | test invalid operation           | 0 | 6 | -128 | 127   | 0    |          |      |          |      |      |      | N/A       | test invalid operation           |  |
| 0 | 7  | -128  | 127  | 0    |          |      |          |      |      |      | N/A       | test invalid operation           | 0 | 7 | -128 | 127   | 0    |          |      |          |      |      |      | N/A       | test invalid operation           |  |
| 9 | 64 | -1104 | 1483 | -182 | 9        | 7    | 8        | 3    | 3    | 1    | 0         |                                  | 0 | 9 | 64   | -1104 | 1483 | -182     | 9    | 7        | 8    | 3    | 3    | 1         | 0                                |  |

| M | F  | X     | Y    | S    | Negative | Cout | Overflow | Zero | Gout | Pout | Comment   | Purpose                          | M | F | X    | Y     | S    | Negative | Cout | Overflow | Zero | Gout | Pout | Comment   | Purpose                          |   |
|---|----|-------|------|------|----------|------|----------|------|------|------|-----------|----------------------------------|---|---|------|-------|------|----------|------|----------|------|------|------|-----------|----------------------------------|---|
| 1 | 1  | -86   | 85   | -1   |          |      |          |      |      |      | X nand Y  | test nand                        | 1 | 1 | -86  | 85    | -1   |          |      |          |      |      |      | X nand Y  | test nand                        |   |
| 1 | 0  | -86   | 85   | 0    |          |      |          |      |      |      | X and Y   | test and                         | 1 | 0 | -86  | 85    | 0    |          |      |          |      |      |      | X and Y   | test and                         |   |
| 1 | 1  | -86   | 85   | -1   |          |      |          |      |      |      | X nand Y  | test nand                        | 1 | 1 | -86  | 85    | -1   |          |      |          |      |      |      | X nand Y  | test nand                        |   |
| 1 | 2  | -86   | 85   | -1   |          |      |          |      |      |      | X or Y    | test or                          | 1 | 2 | -86  | 85    | -1   |          |      |          |      |      |      | X or Y    | test or                          |   |
| 1 | 3  | -86   | 85   | 0    |          |      |          |      |      |      | X nor Y   | test nor                         | 1 | 3 | -86  | 85    | 0    |          |      |          |      |      |      | X nor Y   | test nor                         |   |
| 1 | 4  | -86   | 85   | -1   |          |      |          |      |      |      | X xor Y   | test xor                         | 1 | 4 | -86  | 85    | -1   |          |      |          |      |      |      | X xor Y   | test xor                         |   |
| 1 | 5  | -86   | 85   | 0    |          |      |          |      |      |      | X xnor Y  | test xnor                        | 1 | 5 | -86  | 85    | 0    |          |      |          |      |      |      | X xnor Y  | test xnor                        |   |
| 1 | 6  | -86   | 85   | -86  | 1        |      |          | 0    |      |      | X         | test X                           | 1 | 6 | -86  | 85    | -86  |          |      |          | 0    |      |      | X         | test X                           |   |
| 1 | 7  | -86   | -86  | -86  | 1        |      |          | 0    |      |      | Y         | test Y                           | 1 | 7 | -86  | -86   | -86  | 1        |      |          | 0    |      |      | Y         | test Y                           |   |
| 0 | 0  | 14    | -14  | 0    | 0        | 1    | 0        | 1    | 1    | 0    | X plus Y  | test Z for addition              | 0 | 0 | 14   | -14   | 0    | 0        | 1    | 0        | 1    | 1    | 0    | X plus Y  | test Z for addition              |   |
| 0 | 0  | 14    | -15  | -1   | 1        | 0    | 0        | 0    | 0    | 1    | X plus Y  | test N for addition              | 0 | 0 | 14   | -15   | -1   | 1        | 0    | 0        | 0    | 0    | 1    | X plus Y  | test N for addition              |   |
| 0 | 0  | 14    | 127  | -115 | 1        | 0    | 1        | 0    | 0    | 0    | X plus Y  | test V upwards for addition      | 0 | 0 | 14   | 127   | -115 | 1        | 0    | 1        | 0    | 0    | 0    | X plus Y  | test V upwards for addition      |   |
| 0 | 0  | -14   | -127 | 115  | 0        | 1    | 1        | 0    | 1    | 0    | X plus Y  | test V downwards for addition    | 0 | 0 | -14  | -127  | 115  | 0        | 1    | 1        | 0    | 1    | 0    | X plus Y  | test V downwards for addition    |   |
| 0 | 1  | 14    | 14   | 0    | 0        | 1    | 0        | 1    |      |      | X minus Y | test Z for subtraction           | 0 | 1 | 14   | 14    | 0    | 0        | 1    | 0        | 1    |      |      | X minus Y | test Z for subtraction           |   |
| 0 | 1  | 14    | 15   | -1   | 1        | 0    | 0        | 0    |      |      | X minus Y | test N for subtraction           | 0 | 1 | 14   | 15    | -1   | 1        | 0    | 0        | 0    |      |      | X minus Y | test N for subtraction           |   |
| 0 | 1  | 14    | -127 | -115 | 1        | 0    | 1        | 0    |      |      | X minus Y | test V upwards for subtraction   | 0 | 1 | 14   | -127  | -115 | 1        | 0    | 1        | 0    |      |      | X minus Y | test V upwards for subtraction   |   |
| 0 | 1  | -14   | 127  | 115  | 0        | 1    | 1        | 0    |      |      | X minus Y | test V downwards for subtraction | 0 | 1 | -14  | 127   | 115  | 0        | 1    | 1        | 0    |      |      | X minus Y | test V downwards for subtraction |   |
| 0 | 2  | 127   | 127  | -128 | 1        | 0    | 1        | 0    | 0    | 0    | X plus 1  | test V upwards for increment     | 0 | 2 | 127  | 127   | -128 | 1        | 0    | 1        | 0    | 0    | 0    | X plus 1  | test V upwards for increment     |   |
| 0 | 3  | -128  | 127  | 127  | 0        | 1    | 1        | 0    |      |      | X minus 1 | test V downwards for decrement   | 0 | 3 | -128 | 127   | 127  | 0        | 1    | 1        | 0    |      |      | X minus 1 | test V downwards for decrement   |   |
| 0 | 4  | 127   | 127  | -2   | 1        | 0    | 1        | 0    | 0    | 0    | X plus X  | test V upwards for doubling      | 0 | 4 | 127  | 127   | -2   | 1        | 0    | 1        | 0    | 0    | 0    | X plus X  | test V upwards for doubling      |   |
| 0 | 4  | -128  | 127  | 0    | 0        | 1    | 1        | 1    | 1    | 0    | X plus X  | test V downwards for doubling    | 0 | 4 | -128 | 127   | 0    | 0        | 1    | 1        | 1    | 1    | 0    | X plus X  | test V downwards for doubling    |   |
| 0 | 5  | -128  | 127  | -1   | 1        | 1    |          |      |      |      | minus 1   | test N C for -1                  | 0 | 5 | -128 | 127   | -1   | 1        | 1    |          |      |      |      | minus 1   | test N C for -1                  |   |
| 0 | 6  | -128  | 127  | 0    |          |      |          |      |      |      | N/A       | test invalid operation           | 0 | 6 | -128 | 127   | 0    |          |      |          |      |      |      | N/A       | test invalid operation           |   |
| 0 | 7  | -128  | 127  | 0    |          |      |          |      |      |      | N/A       | test invalid operation           | 0 | 7 | -128 | 127   | 0    |          |      |          |      |      |      | N/A       | test invalid operation           |   |
| 9 | 64 | -1104 | 1483 | -182 | 9        | 7    | 8        | 3    | 3    | 1    | 0         |                                  | 0 | 9 | 64   | -1104 | 1483 | -182     | 9    | 7        | 8    | 3    | 3    | 1         | 0                                | 0 |

| M | F  | X     | Y    | S    | Negative | Cout | Overflow | Zero | Gout | Pout | Comment   | Purpose                          | M | F | X    | Y     | S    | Negative | Cout | Overflow | Zero | Gout | Pout | Comment   | Purpose                          |                               |   |
|---|----|-------|------|------|----------|------|----------|------|------|------|-----------|----------------------------------|---|---|------|-------|------|----------|------|----------|------|------|------|-----------|----------------------------------|-------------------------------|---|
| 1 | 1  | -86   | 85   | -1   |          |      |          |      |      |      | X nand Y  | test nand                        | 1 | 1 | -86  | 85    | -1   |          |      |          |      |      |      | X nand Y  | test nand                        |                               |   |
| 1 | 0  | -86   | 85   | 0    |          |      |          |      |      |      | X and Y   | test and                         | 1 | 0 | -86  | 85    | 0    |          |      |          |      |      |      | X and Y   | test and                         |                               |   |
| 1 | 1  | -86   | 85   | -1   |          |      |          |      |      |      | X nand Y  | test nand                        | 1 | 1 | -86  | 85    | -1   |          |      |          |      |      |      | X nand Y  | test nand                        |                               |   |
| 1 | 2  | -86   | 85   | -1   |          |      |          |      |      |      | X or Y    | test or                          | 1 | 2 | -86  | 85    | -1   |          |      |          |      |      |      | X or Y    | test or                          |                               |   |
| 1 | 3  | -86   | 85   | 0    |          |      |          |      |      |      | X nor Y   | test nor                         | 1 | 3 | -86  | 85    | 0    |          |      |          |      |      |      | X nor Y   | test nor                         |                               |   |
| 1 | 4  | -86   | 85   | -1   |          |      |          |      |      |      | X xor Y   | test xor                         | 1 | 4 | -86  | 85    | -1   |          |      |          |      |      |      | X xor Y   | test xor                         |                               |   |
| 1 | 5  | -86   | 85   | 0    |          |      |          |      |      |      | X xnor Y  | test xnor                        | 1 | 5 | -86  | 85    | 0    |          |      |          |      |      |      | X xnor Y  | test xnor                        |                               |   |
| 1 | 6  | -86   | 85   | -86  | 1        |      |          | 0    |      |      | X         | test X                           | 1 | 6 | -86  | 85    | -86  | 1        |      |          | 0    |      |      | X         | test X                           |                               |   |
| 1 | 7  | -86   | -86  | -86  | 1        |      |          | 0    |      |      | Y         | test Y                           | 1 | 7 | -86  | -86   | -86  | 1        |      |          | 0    |      |      | Y         | test Y                           |                               |   |
| 0 | 0  | 14    | -14  | 0    | 0        | 1    | 0        | 1    | 1    | 0    | X plus Y  | test Z for addition              | 0 | 0 | 14   | -14   | 0    | 0        | 1    | 0        | 0    | 1    | 1    | 0         | X plus Y                         | test Z for addition           |   |
| 0 | 0  | 14    | -15  | -1   | 1        | 0    | 0        | 0    | 0    | 0    | X plus Y  | test N for addition              | 0 | 0 | 14   | -15   | -1   | 1        | 0    | 0        | 0    | 0    | 0    | 1         | X plus Y                         | test N for addition           |   |
| 0 | 0  | 14    | 127  | -115 | 1        | 0    | 1        | 0    | 0    | 0    | X plus Y  | test V upwards for addition      | 0 | 0 | 14   | 127   | -115 | 1        | 0    | 1        | 0    | 0    | 0    | 0         | X plus Y                         | test V upwards for addition   |   |
| 0 | 0  | -14   | -127 | 115  | 0        | 1    | 1        | 0    | 1    | 0    | X plus Y  | test V downwards for addition    | 0 | 0 | -14  | -127  | 115  | 0        | 1    | 1        | 0    | 1    | 0    | 0         | X plus Y                         | test V downwards for addition |   |
| 0 | 1  | 14    | 14   | 0    | 0        | 1    | 0        | 1    |      |      | X minus Y | test Z for subtraction           | 0 | 1 | 14   | 14    | 0    | 0        | 1    | 0        | 1    |      |      | X minus Y | test Z for subtraction           |                               |   |
| 0 | 1  | 14    | 15   | -1   | 1        | 0    | 0        | 0    |      |      | X minus Y | test N for subtraction           | 0 | 1 | 14   | 15    | -1   | 1        | 0    | 0        | 0    |      |      | X minus Y | test N for subtraction           |                               |   |
| 0 | 1  | 14    | -127 | -115 | 1        | 0    | 1        | 0    |      |      | X minus Y | test V upwards for subtraction   | 0 | 1 | 14   | -127  | -115 | 1        | 0    | 1        | 0    |      |      | X minus Y | test V upwards for subtraction   |                               |   |
| 0 | 1  | -14   | 127  | 115  | 0        | 1    | 1        | 0    |      |      | X minus Y | test V downwards for subtraction | 0 | 1 | -14  | 127   | 115  | 0        | 1    | 1        | 0    |      |      | X minus Y | test V downwards for subtraction |                               |   |
| 0 | 2  | 127   | 127  | -128 | 1        | 0    | 1        | 0    | 0    | 0    | X plus 1  | test V upwards for increment     | 0 | 2 | 127  | 127   | -128 | 1        | 0    | 1        | 0    | 0    | 0    | X plus 1  | test V upwards for increment     |                               |   |
| 0 | 3  | -128  | 127  | 127  | 0        | 1    | 1        | 0    |      |      | X minus 1 | test V downwards for decrement   | 0 | 3 | -128 | 127   | 127  | 0        | 1    | 1        | 0    |      |      | X minus 1 | test V downwards for decrement   |                               |   |
| 0 | 4  | 127   | 127  | -2   | 1        | 0    | 1        | 0    | 0    | 0    | X plus X  | test V upwards for doubling      | 0 | 4 | 127  | 127   | -2   | 1        | 0    | 1        | 0    | 0    | 0    | X plus X  | test V upwards for doubling      |                               |   |
| 0 | 4  | -128  | 127  | 0    | 0        | 1    | 1        | 1    | 1    | 0    | X plus X  | test V downwards for doubling    | 0 | 4 | -128 | 127   | 0    | 0        | 1    | 1        | 1    | 1    | 0    | X plus X  | test V downwards for doubling    |                               |   |
| 0 | 5  | -128  | 127  | -1   | 1        | 1    |          |      |      |      | minus 1   | test N C for -1                  | 0 | 5 | -128 | 127   | -1   | 1        | 1    |          |      |      |      | minus 1   | test N C for -1                  |                               |   |
| 0 | 6  | -128  | 127  | 0    |          |      |          |      |      |      | N/A       | test invalid operation           | 0 | 6 | -128 | 127   | 0    |          |      |          |      |      |      | N/A       | test invalid operation           |                               |   |
| 0 | 7  | -128  | 127  | 0    |          |      |          |      |      |      | N/A       | test invalid operation           | 0 | 7 | -128 | 127   | 0    |          |      |          |      |      |      | N/A       | test invalid operation           |                               |   |
| 9 | 64 | -1104 | 1483 | -182 | 9        | 7    | 8        | 3    | 3    | 1    | 0         |                                  | 0 | 9 | 64   | -1104 | 1483 | -182     | 9    | 7        | 8    | 3    | 3    | 1         | 0                                |                               | 0 |

| M | F  | X     | Y    | S    | Negative | Cout | Overflow | Zero | Gout | Pout | Comment   | Purpose                          | M | F | X    | Y     | S    | Negative | Cout | Overflow | Zero | Gout | Pout | Comment   | Purpose                          |  |
|---|----|-------|------|------|----------|------|----------|------|------|------|-----------|----------------------------------|---|---|------|-------|------|----------|------|----------|------|------|------|-----------|----------------------------------|--|
| 1 | 1  | -86   | 85   | -1   |          |      |          |      |      |      | X nand Y  | test nand                        | 1 | 1 | -86  | 85    | -1   |          |      |          |      |      |      | X nand Y  | test nand                        |  |
| 1 | 0  | -86   | 85   | 0    |          |      |          |      |      |      | X and Y   | test and                         | 1 | 0 | -86  | 85    | 0    |          |      |          |      |      |      | X and Y   | test and                         |  |
| 1 | 1  | -86   | 85   | -1   |          |      |          |      |      |      | X nand Y  | test nand                        | 1 | 1 | -86  | 85    | -1   |          |      |          |      |      |      | X nand Y  | test nand                        |  |
| 1 | 2  | -86   | 85   | -1   |          |      |          |      |      |      | X or Y    | test or                          | 1 | 2 | -86  | 85    | -1   |          |      |          |      |      |      | X or Y    | test or                          |  |
| 1 | 3  | -86   | 85   | 0    |          |      |          |      |      |      | X nor Y   | test nor                         | 1 | 3 | -86  | 85    | 0    |          |      |          |      |      |      | X nor Y   | test nor                         |  |
| 1 | 4  | -86   | 85   | -1   |          |      |          |      |      |      | X xor Y   | test xor                         | 1 | 4 | -86  | 85    | -1   |          |      |          |      |      |      | X xor Y   | test xor                         |  |
| 1 | 5  | -86   | 85   | 0    |          |      |          |      |      |      | X xnor Y  | test xnor                        | 1 | 5 | -86  | 85    | 0    |          |      |          |      |      |      | X xnor Y  | test xnor                        |  |
| 1 | 6  | -86   | 85   | -86  | 1        |      |          | 0    |      |      | X         | test X                           | 1 | 6 | -86  | 85    | -86  |          |      |          | 0    |      |      | X         | test X                           |  |
| 1 | 7  | -86   | -86  | -86  | 1        |      |          | 0    |      |      | Y         | test Y                           | 1 | 7 | -86  | -86   | -86  | 1        |      |          | 0    |      |      | Y         | test Y                           |  |
| 0 | 0  | 14    | -14  | 0    | 0        | 1    | 0        | 1    | 1    | 0    | X plus Y  | test Z for addition              | 0 | 0 | 14   | -14   | 0    | 0        | 1    | 0        | 1    | 1    | 0    | X plus Y  | test Z for addition              |  |
| 0 | 0  | 14    | -15  | -1   | 1        | 0    | 0        | 0    | 0    | 1    | X plus Y  | test N for addition              | 0 | 0 | 14   | -15   | -1   | 1        | 0    | 0        | 0    | 0    | 1    | X plus Y  | test N for addition              |  |
| 0 | 0  | 14    | 127  | -115 | 1        | 0    | 1        | 0    | 0    | 0    | X plus Y  | test V upwards for addition      | 0 | 0 | 14   | 127   | -115 | 1        | 0    | 1        | 0    | 0    | 0    | X plus Y  | test V upwards for addition      |  |
| 0 | 0  | -14   | -127 | 115  | 0        | 1    | 1        | 0    | 1    | 0    | X plus Y  | test V downwards for addition    | 0 | 0 | -14  | -127  | 115  | 0        | 1    | 1        | 0    | 1    | 0    | X plus Y  | test V downwards for addition    |  |
| 0 | 1  | 14    | 14   | 0    | 0        | 1    | 0        | 1    |      |      | X minus Y | test Z for subtraction           | 0 | 1 | 14   | 14    | 0    | 0        | 1    | 0        | 1    |      |      | X minus Y | test Z for subtraction           |  |
| 0 | 1  | 14    | 15   | -1   | 1        | 0    | 0        | 0    |      |      | X minus Y | test N for subtraction           | 0 | 1 | 14   | 15    | -1   | 1        | 0    | 0        | 0    |      |      | X minus Y | test N for subtraction           |  |
| 0 | 1  | 14    | -127 | -115 | 1        | 0    | 1        | 0    |      |      | X minus Y | test V upwards for subtraction   | 0 | 1 | 14   | -127  | -115 | 1        | 0    | 1        | 0    |      |      | X minus Y | test V upwards for subtraction   |  |
| 0 | 1  | -14   | 127  | 115  | 0        | 1    | 1        | 0    |      |      | X minus Y | test V downwards for subtraction | 0 | 1 | -14  | 127   | 115  | 0        | 1    | 1        | 0    |      |      | X minus Y | test V downwards for subtraction |  |
| 0 | 2  | 127   | 127  | -128 | 1        | 0    | 1        | 0    | 0    | 0    | X plus 1  | test V upwards for increment     | 0 | 2 | 127  | 127   | -128 | 1        | 0    | 1        | 0    | 0    | 0    | X plus 1  | test V upwards for increment     |  |
| 0 | 3  | -128  | 127  | 127  | 0        | 1    | 1        | 0    |      |      | X minus 1 | test V downwards for decrement   | 0 | 3 | -128 | 127   | 127  | 0        | 1    | 1        | 0    |      |      | X minus 1 | test V downwards for decrement   |  |
| 0 | 4  | 127   | 127  | -2   | 1        | 0    | 1        | 0    | 0    | 0    | X plus X  | test V upwards for doubling      | 0 | 4 | 127  | 127   | -2   | 1        | 0    | 1        | 0    | 0    | 0    | X plus X  | test V upwards for doubling      |  |
| 0 | 4  | -128  | 127  | 0    | 0        | 1    | 1        | 1    | 1    | 0    | X plus X  | test V downwards for doubling    | 0 | 4 | -128 | 127   | 0    | 0        | 1    | 1        | 1    | 1    | 0    | X plus X  | test V downwards for doubling    |  |
| 0 | 5  | -128  | 127  | -1   | 1        | 1    |          |      |      |      | minus 1   | test N C for -1                  | 0 | 5 | -128 | 127   | -1   | 1        | 1    |          |      |      |      | minus 1   | test N C for -1                  |  |
| 0 | 6  | -128  | 127  | 0    |          |      |          |      |      |      | N/A       | test invalid operation           | 0 | 6 | -128 | 127   | 0    |          |      |          |      |      |      | N/A       | test invalid operation           |  |
| 0 | 7  | -128  | 127  | 0    |          |      |          |      |      |      | N/A       | test invalid operation           | 0 | 7 | -128 | 127   | 0    |          |      |          |      |      |      | N/A       | test invalid operation           |  |
| 9 | 64 | -1104 | 1483 | -182 | 9        | 7    | 8        | 3    | 3    | 1    | 0         |                                  | 0 | 9 | 64   | -1104 | 1483 | -182     | 9    | 7        | 8    | 3    | 3    | 1         | 0                                |  |

| M | F  | X     | Y    | S    | Negative | Cout | Overflow | Zero | Gout | Pout | Comment   | Purpose                          | M | F | X    | Y     | S    | Negative | Cout | Overflow | Zero | Gout | Pout | Comment   | Purpose                          |                               |   |
|---|----|-------|------|------|----------|------|----------|------|------|------|-----------|----------------------------------|---|---|------|-------|------|----------|------|----------|------|------|------|-----------|----------------------------------|-------------------------------|---|
| 1 | 1  | -86   | 85   | -1   |          |      |          |      |      |      | X nand Y  | test nand                        | 1 | 1 | -86  | 85    | -1   |          |      |          |      |      |      | X nand Y  | test nand                        |                               |   |
| 1 | 0  | -86   | 85   | 0    |          |      |          |      |      |      | X and Y   | test and                         | 1 | 0 | -86  | 85    | 0    |          |      |          |      |      |      | X and Y   | test and                         |                               |   |
| 1 | 1  | -86   | 85   | -1   |          |      |          |      |      |      | X nand Y  | test nand                        | 1 | 1 | -86  | 85    | -1   |          |      |          |      |      |      | X nand Y  | test nand                        |                               |   |
| 1 | 2  | -86   | 85   | -1   |          |      |          |      |      |      | X or Y    | test or                          | 1 | 2 | -86  | 85    | -1   |          |      |          |      |      |      | X or Y    | test or                          |                               |   |
| 1 | 3  | -86   | 85   | 0    |          |      |          |      |      |      | X nor Y   | test nor                         | 1 | 3 | -86  | 85    | 0    |          |      |          |      |      |      | X nor Y   | test nor                         |                               |   |
| 1 | 4  | -86   | 85   | -1   |          |      |          |      |      |      | X xor Y   | test xor                         | 1 | 4 | -86  | 85    | -1   |          |      |          |      |      |      | X xor Y   | test xor                         |                               |   |
| 1 | 5  | -86   | 85   | 0    |          |      |          |      |      |      | X xnor Y  | test xnor                        | 1 | 5 | -86  | 85    | 0    |          |      |          |      |      |      | X xnor Y  | test xnor                        |                               |   |
| 1 | 6  | -86   | 85   | -86  | 1        |      |          | 0    |      |      | X         | test X                           | 1 | 6 | -86  | 85    | -86  | 1        |      |          | 0    |      |      | X         | test X                           |                               |   |
| 1 | 7  | -86   | -86  | -86  | 1        |      |          | 0    |      |      | Y         | test Y                           | 1 | 7 | -86  | -86   | -86  | 1        |      |          | 0    |      |      | Y         | test Y                           |                               |   |
| 0 | 0  | 14    | -14  | 0    | 0        | 1    | 0        | 1    | 1    | 0    | X plus Y  | test Z for addition              | 0 | 0 | 14   | -14   | 0    | 0        | 1    | 0        | 0    | 1    | 1    | 0         | X plus Y                         | test Z for addition           |   |
| 0 | 0  | 14    | -15  | -1   | 1        | 0    | 0        | 0    | 0    | 0    | X plus Y  | test N for addition              | 0 | 0 | 14   | -15   | -1   | 1        | 0    | 0        | 0    | 0    | 0    | 1         | X plus Y                         | test N for addition           |   |
| 0 | 0  | 14    | 127  | -115 | 1        | 0    | 1        | 0    | 0    | 0    | X plus Y  | test V upwards for addition      | 0 | 0 | 14   | 127   | -115 | 1        | 0    | 1        | 0    | 0    | 0    | 0         | X plus Y                         | test V upwards for addition   |   |
| 0 | 0  | -14   | -127 | 115  | 0        | 1    | 1        | 0    | 1    | 0    | X plus Y  | test V downwards for addition    | 0 | 0 | -14  | -127  | 115  | 0        | 1    | 1        | 0    | 1    | 0    | 0         | X plus Y                         | test V downwards for addition |   |
| 0 | 1  | 14    | 14   | 0    | 0        | 1    | 0        | 1    |      |      | X minus Y | test Z for subtraction           | 0 | 1 | 14   | 14    | 0    | 0        | 1    | 0        | 1    |      |      | X minus Y | test Z for subtraction           |                               |   |
| 0 | 1  | 14    | 15   | -1   | 1        | 0    | 0        | 0    |      |      | X minus Y | test N for subtraction           | 0 | 1 | 14   | 15    | -1   | 1        | 0    | 0        | 0    |      |      | X minus Y | test N for subtraction           |                               |   |
| 0 | 1  | 14    | -127 | -115 | 1        | 0    | 1        | 0    |      |      | X minus Y | test V upwards for subtraction   | 0 | 1 | 14   | -127  | -115 | 1        | 0    | 1        | 0    |      |      | X minus Y | test V upwards for subtraction   |                               |   |
| 0 | 1  | -14   | 127  | 115  | 0        | 1    | 1        | 0    |      |      | X minus Y | test V downwards for subtraction | 0 | 1 | -14  | 127   | 115  | 0        | 1    | 1        | 0    |      |      | X minus Y | test V downwards for subtraction |                               |   |
| 0 | 2  | 127   | 127  | -128 | 1        | 0    | 1        | 0    | 0    | 0    | X plus 1  | test V upwards for increment     | 0 | 2 | 127  | 127   | -128 | 1        | 0    | 1        | 0    | 0    | 0    | X plus 1  | test V upwards for increment     |                               |   |
| 0 | 3  | -128  | 127  | 127  | 0        | 1    | 1        | 0    |      |      | X minus 1 | test V downwards for decrement   | 0 | 3 | -128 | 127   | 127  | 0        | 1    | 1        | 0    |      |      | X minus 1 | test V downwards for decrement   |                               |   |
| 0 | 4  | 127   | 127  | -2   | 1        | 0    | 1        | 0    | 0    | 0    | X plus X  | test V upwards for doubling      | 0 | 4 | 127  | 127   | -2   | 1        | 0    | 1        | 0    | 0    | 0    | X plus X  | test V upwards for doubling      |                               |   |
| 0 | 4  | -128  | 127  | 0    | 0        | 1    | 1        | 1    | 1    | 0    | X plus X  | test V downwards for doubling    | 0 | 4 | -128 | 127   | 0    | 0        | 1    | 1        | 1    | 1    | 0    | X plus X  | test V downwards for doubling    |                               |   |
| 0 | 5  | -128  | 127  | -1   | 1        | 1    |          |      |      |      | minus 1   | test N C for -1                  | 0 | 5 | -128 | 127   | -1   | 1        | 1    |          |      |      |      | minus 1   | test N C for -1                  |                               |   |
| 0 | 6  | -128  | 127  | 0    |          |      |          |      |      |      | N/A       | test invalid operation           | 0 | 6 | -128 | 127   | 0    |          |      |          |      |      |      | N/A       | test invalid operation           |                               |   |
| 0 | 7  | -128  | 127  | 0    |          |      |          |      |      |      | N/A       | test invalid operation           | 0 | 7 | -128 | 127   | 0    |          |      |          |      |      |      | N/A       | test invalid operation           |                               |   |
| 9 | 64 | -1104 | 1483 | -182 | 9        | 7    | 8        | 3    | 3    | 1    | 0         |                                  | 0 | 9 | 64   | -1104 | 1483 | -182     | 9    | 7        | 8    | 3    | 3    | 1         | 0                                |                               | 0 |

| M | F  | X     | Y    | S    | Negative | Cout | Overflow | Zero | Gout | Pout | Comment   | Purpose                          | M | F | X    | Y     | S    | Negative | Cout | Overflow | Zero | Gout | Pout | Comment   | Purpose                          |  |   |
|---|----|-------|------|------|----------|------|----------|------|------|------|-----------|----------------------------------|---|---|------|-------|------|----------|------|----------|------|------|------|-----------|----------------------------------|--|---|
| 1 | 1  | -86   | 85   | -1   |          |      |          |      |      |      | X nand Y  | test nand                        | 1 | 1 | -86  | 85    | -1   |          |      |          |      |      |      | X nand Y  | test nand                        |  |   |
| 1 | 0  | -86   | 85   | 0    |          |      |          |      |      |      | X and Y   | test and                         | 1 | 0 | -86  | 85    | 0    |          |      |          |      |      |      | X and Y   | test and                         |  |   |
| 1 | 1  | -86   | 85   | -1   |          |      |          |      |      |      | X nand Y  | test nand                        | 1 | 1 | -86  | 85    | -1   |          |      |          |      |      |      | X nand Y  | test nand                        |  |   |
| 1 | 2  | -86   | 85   | -1   |          |      |          |      |      |      | X or Y    | test or                          | 1 | 2 | -86  | 85    | -1   |          |      |          |      |      |      | X or Y    | test or                          |  |   |
| 1 | 3  | -86   | 85   | 0    |          |      |          |      |      |      | X nor Y   | test nor                         | 1 | 3 | -86  | 85    | 0    |          |      |          |      |      |      | X nor Y   | test nor                         |  |   |
| 1 | 4  | -86   | 85   | -1   |          |      |          |      |      |      | X xor Y   | test xor                         | 1 | 4 | -86  | 85    | -1   |          |      |          |      |      |      | X xor Y   | test xor                         |  |   |
| 1 | 5  | -86   | 85   | 0    |          |      |          |      |      |      | X xnor Y  | test xnor                        | 1 | 5 | -86  | 85    | 0    |          |      |          |      |      |      | X xnor Y  | test xnor                        |  |   |
| 1 | 6  | -86   | 85   | -86  | 1        |      |          | 0    |      |      | X         | test X                           | 1 | 6 | -86  | 85    | -86  | 1        |      |          | 0    |      |      | X         | test X                           |  |   |
| 1 | 7  | -86   | -86  | -86  | 1        |      |          | 0    |      |      | Y         | test Y                           | 1 | 7 | -86  | -86   | -86  | 1        |      |          | 0    |      |      | Y         | test Y                           |  |   |
| 0 | 0  | 14    | -14  | 0    | 0        | 1    | 0        | 1    | 1    | 0    | X plus Y  | test Z for addition              | 0 | 0 | 14   | -14   | 0    | 0        | 1    | 0        | 1    | 1    | 0    | X plus Y  | test Z for addition              |  |   |
| 0 | 0  | 14    | -15  | -1   | 1        | 0    | 0        | 0    | 0    | 1    | X plus Y  | test N for addition              | 0 | 0 | 14   | -15   | -1   | 1        | 0    | 0        | 0    | 0    | 1    | X plus Y  | test N for addition              |  |   |
| 0 | 0  | 14    | 127  | -115 | 1        | 0    | 1        | 0    | 0    | 0    | X plus Y  | test V upwards for addition      | 0 | 0 | 14   | 127   | -115 | 1        | 0    | 1        | 0    | 0    | 0    | X plus Y  | test V upwards for addition      |  |   |
| 0 | 0  | -14   | -127 | 115  | 0        | 1    | 1        | 0    | 1    | 0    | X plus Y  | test V downwards for addition    | 0 | 0 | -14  | -127  | 115  | 0        | 1    | 1        | 0    | 1    | 0    | X plus Y  | test V downwards for addition    |  |   |
| 0 | 1  | 14    | 14   | 0    | 0        | 1    | 0        | 1    |      |      | X minus Y | test Z for subtraction           | 0 | 1 | 14   | 14    | 0    | 0        | 1    | 0        | 1    |      |      | X minus Y | test Z for subtraction           |  |   |
| 0 | 1  | 14    | 15   | -1   | 1        | 0    | 0        | 0    |      |      | X minus Y | test N for subtraction           | 0 | 1 | 14   | 15    | -1   | 1        | 0    | 0        | 0    |      |      | X minus Y | test N for subtraction           |  |   |
| 0 | 1  | 14    | -127 | -115 | 1        | 0    | 1        | 0    |      |      | X minus Y | test V upwards for subtraction   | 0 | 1 | 14   | -127  | -115 | 1        | 0    | 1        | 0    |      |      | X minus Y | test V upwards for subtraction   |  |   |
| 0 | 1  | -14   | 127  | 115  | 0        | 1    | 1        | 0    |      |      | X minus Y | test V downwards for subtraction | 0 | 1 | -14  | 127   | 115  | 0        | 1    | 1        | 0    |      |      | X minus Y | test V downwards for subtraction |  |   |
| 0 | 2  | 127   | 127  | -128 | 1        | 0    | 1        | 0    | 0    | 0    | X plus 1  | test V upwards for increment     | 0 | 2 | 127  | 127   | -128 | 1        | 0    | 1        | 0    | 0    | 0    | X plus 1  | test V upwards for increment     |  |   |
| 0 | 3  | -128  | 127  | 127  | 0        | 1    | 1        | 0    |      |      | X minus 1 | test V downwards for decrement   | 0 | 3 | -128 | 127   | 127  | 0        | 1    | 1        | 0    |      |      | X minus 1 | test V downwards for decrement   |  |   |
| 0 | 4  | 127   | 127  | -2   | 1        | 0    | 1        | 0    | 0    | 0    | X plus X  | test V upwards for doubling      | 0 | 4 | 127  | 127   | -2   | 1        | 0    | 1        | 0    | 0    | 0    | X plus X  | test V upwards for doubling      |  |   |
| 0 | 4  | -128  | 127  | 0    | 0        | 1    | 1        | 1    | 1    | 0    | X plus X  | test V downwards for doubling    | 0 | 4 | -128 | 127   | 0    | 0        | 1    | 1        | 1    | 1    | 0    | X plus X  | test V downwards for doubling    |  |   |
| 0 | 5  | -128  | 127  | -1   | 1        | 1    |          |      |      |      | minus 1   | test N C for -1                  | 0 | 5 | -128 | 127   | -1   | 1        | 1    |          |      |      |      | minus 1   | test N C for -1                  |  |   |
| 0 | 6  | -128  | 127  | 0    |          |      |          |      |      |      | N/A       | test invalid operation           | 0 | 6 | -128 | 127   | 0    |          |      |          |      |      |      | N/A       | test invalid operation           |  |   |
| 0 | 7  | -128  | 127  | 0    |          |      |          |      |      |      | N/A       | test invalid operation           | 0 | 7 | -128 | 127   | 0    |          |      |          |      |      |      | N/A       | test invalid operation           |  |   |
| 9 | 64 | -1104 | 1483 | -182 | 9        | 7    | 8        | 3    | 3    | 1    | 0         |                                  | 0 | 9 | 64   | -1104 | 1483 | -182     | 9    | 7        | 8    | 3    | 3    | 1         | 0                                |  | 0 |



| M | F  | X     | Y    | S    | Negative | Cout | Overflow | Zero | Gout | Pout | Comment   | Purpose                          | M | F | X    | Y     | S    | Negative | Cout | Overflow | Zero | Gout | Pout | Comment   | Purpose                          |  |
|---|----|-------|------|------|----------|------|----------|------|------|------|-----------|----------------------------------|---|---|------|-------|------|----------|------|----------|------|------|------|-----------|----------------------------------|--|
| 1 | 1  | -86   | 85   | -1   |          |      |          |      |      |      | X nand Y  | test nand                        | 1 | 1 | -86  | 85    | -1   |          |      |          |      |      |      | X nand Y  | test nand                        |  |
| 1 | 0  | -86   | 85   | 0    |          |      |          |      |      |      | X and Y   | test and                         | 1 | 0 | -86  | 85    | 0    |          |      |          |      |      |      | X and Y   | test and                         |  |
| 1 | 1  | -86   | 85   | -1   |          |      |          |      |      |      | X nand Y  | test nand                        | 1 | 1 | -86  | 85    | -1   |          |      |          |      |      |      | X nand Y  | test nand                        |  |
| 1 | 2  | -86   | 85   | -1   |          |      |          |      |      |      | X or Y    | test or                          | 1 | 2 | -86  | 85    | -1   |          |      |          |      |      |      | X or Y    | test or                          |  |
| 1 | 3  | -86   | 85   | 0    |          |      |          |      |      |      | X nor Y   | test nor                         | 1 | 3 | -86  | 85    | 0    |          |      |          |      |      |      | X nor Y   | test nor                         |  |
| 1 | 4  | -86   | 85   | -1   |          |      |          |      |      |      | X xor Y   | test xor                         | 1 | 4 | -86  | 85    | -1   |          |      |          |      |      |      | X xor Y   | test xor                         |  |
| 1 | 5  | -86   | 85   | 0    |          |      |          |      |      |      | X xnor Y  | test xnor                        | 1 | 5 | -86  | 85    | 0    |          |      |          |      |      |      | X xnor Y  | test xnor                        |  |
| 1 | 6  | -86   | 85   | -86  | 1        |      |          | 0    |      |      | X         | test X                           | 1 | 6 | -86  | 85    | -86  | 1        |      |          | 0    |      |      | X         | test X                           |  |
| 1 | 7  | -86   | -86  | -86  | 1        |      |          | 0    |      |      | Y         | test Y                           | 1 | 7 | -86  | -86   | -86  | 1        |      |          | 0    |      |      | Y         | test Y                           |  |
| 0 | 0  | 14    | -14  | 0    | 0        | 1    | 0        | 1    | 0    | 0    | X plus Y  | test Z for addition              | 0 | 0 | 14   | -14   | 0    | 0        | 1    | 0        | 1    | 1    | 0    | X plus Y  | test Z for addition              |  |
| 0 | 0  | 14    | -15  | -1   | 1        | 0    | 0        | 0    | 0    | 1    | X plus Y  | test N for addition              | 0 | 0 | 14   | -15   | -1   | 1        | 0    | 0        | 0    | 0    | 1    | X plus Y  | test N for addition              |  |
| 0 | 0  | 14    | 127  | -115 | 1        | 0    | 1        | 0    | 0    | 0    | X plus Y  | test V upwards for addition      | 0 | 0 | 14   | 127   | -115 | 1        | 0    | 1        | 0    | 0    | 0    | X plus Y  | test V upwards for addition      |  |
| 0 | 0  | -14   | -127 | 115  | 0        | 1    | 1        | 0    | 1    | 0    | X plus Y  | test V downwards for addition    | 0 | 0 | -14  | -127  | 115  | 0        | 1    | 1        | 0    | 1    | 0    | X plus Y  | test V downwards for addition    |  |
| 0 | 1  | 14    | 14   | 0    | 0        | 1    | 0        | 1    |      |      | X minus Y | test Z for subtraction           | 0 | 1 | 14   | 14    | 0    | 0        | 1    | 0        | 1    |      |      | X minus Y | test Z for subtraction           |  |
| 0 | 1  | 14    | 15   | -1   | 1        | 0    | 0        | 0    |      |      | X minus Y | test N for subtraction           | 0 | 1 | 14   | 15    | -1   | 1        | 0    | 0        | 0    |      |      | X minus Y | test N for subtraction           |  |
| 0 | 1  | 14    | -127 | -115 | 1        | 0    | 1        | 0    |      |      | X minus Y | test V upwards for subtraction   | 0 | 1 | 14   | -127  | -115 | 1        | 0    | 1        | 0    |      |      | X minus Y | test V upwards for subtraction   |  |
| 0 | 1  | -14   | 127  | 115  | 0        | 1    | 1        | 0    |      |      | X minus Y | test V downwards for subtraction | 0 | 1 | -14  | 127   | 115  | 0        | 1    | 1        | 0    |      |      | X minus Y | test V downwards for subtraction |  |
| 0 | 2  | 127   | 127  | -128 | 1        | 0    | 1        | 0    | 0    | 0    | X plus 1  | test V upwards for increment     | 0 | 2 | 127  | 127   | -128 | 1        | 0    | 1        | 0    | 0    | 0    | X plus 1  | test V upwards for increment     |  |
| 0 | 3  | -128  | 127  | 127  | 0        | 1    | 1        | 0    |      |      | X minus 1 | test V downwards for decrement   | 0 | 3 | -128 | 127   | 127  | 0        | 1    | 1        | 0    |      |      | X minus 1 | test V downwards for decrement   |  |
| 0 | 4  | 127   | 127  | -2   | 1        | 0    | 1        | 0    | 0    | 0    | X plus X  | test V upwards for doubling      | 0 | 4 | 127  | 127   | -2   | 1        | 0    | 1        | 0    | 0    | 0    | X plus X  | test V upwards for doubling      |  |
| 0 | 4  | -128  | 127  | 0    | 0        | 1    | 1        | 1    | 1    | 0    | X plus X  | test V downwards for doubling    | 0 | 4 | -128 | 127   | 0    | 0        | 1    | 1        | 1    | 1    | 0    | X plus X  | test V downwards for doubling    |  |
| 0 | 5  | -128  | 127  | -1   | 1        | 1    |          |      |      |      | minus 1   | test N C for -1                  | 0 | 5 | -128 | 127   | -1   | 1        | 1    |          |      |      |      | minus 1   | test N C for -1                  |  |
| 0 | 6  | -128  | 127  | 0    |          |      |          |      |      |      | N/A       | test invalid operation           | 0 | 6 | -128 | 127   | 0    |          |      |          |      |      |      | N/A       | test invalid operation           |  |
| 0 | 7  | -128  | 127  | 0    |          |      |          |      |      |      | N/A       | test invalid operation           | 0 | 7 | -128 | 127   | 0    |          |      |          |      |      |      | N/A       | test invalid operation           |  |
| 9 | 64 | -1104 | 1483 | -182 | 9        | 7    | 8        | 3    | 2    | 1    | 0         |                                  | 0 | 9 | 64   | -1104 | 1483 | -182     | 9    | 7        | 8    | 3    | 3    | 1         | 0                                |  |

| M | F  | X     | Y    | S    | Negative | Cout | Overflow | Zero | Gout | Pout | Comment   | Purpose                          | M | F | X    | Y     | S    | Negative | Cout | Overflow | Zero | Gout | Pout | Comment   | Purpose                          |  |   |
|---|----|-------|------|------|----------|------|----------|------|------|------|-----------|----------------------------------|---|---|------|-------|------|----------|------|----------|------|------|------|-----------|----------------------------------|--|---|
| 1 | 1  | -86   | 85   | -1   |          |      |          |      |      |      | X nand Y  | test nand                        | 1 | 1 | -86  | 85    | -1   |          |      |          |      |      |      | X nand Y  | test nand                        |  |   |
| 1 | 0  | -86   | 85   | 0    |          |      |          |      |      |      | X and Y   | test and                         | 1 | 0 | -86  | 85    | 0    |          |      |          |      |      |      | X and Y   | test and                         |  |   |
| 1 | 1  | -86   | 85   | -1   |          |      |          |      |      |      | X nand Y  | test nand                        | 1 | 1 | -86  | 85    | -1   |          |      |          |      |      |      | X nand Y  | test nand                        |  |   |
| 1 | 2  | -86   | 85   | -1   |          |      |          |      |      |      | X or Y    | test or                          | 1 | 2 | -86  | 85    | -1   |          |      |          |      |      |      | X or Y    | test or                          |  |   |
| 1 | 3  | -86   | 85   | 0    |          |      |          |      |      |      | X nor Y   | test nor                         | 1 | 3 | -86  | 85    | 0    |          |      |          |      |      |      | X nor Y   | test nor                         |  |   |
| 1 | 4  | -86   | 85   | -1   |          |      |          |      |      |      | X xor Y   | test xor                         | 1 | 4 | -86  | 85    | -1   |          |      |          |      |      |      | X xor Y   | test xor                         |  |   |
| 1 | 5  | -86   | 85   | 0    |          |      |          |      |      |      | X xnor Y  | test xnor                        | 1 | 5 | -86  | 85    | 0    |          |      |          |      |      |      | X xnor Y  | test xnor                        |  |   |
| 1 | 6  | -86   | 85   | -86  | 1        |      |          | 0    |      |      | X         | test X                           | 1 | 6 | -86  | 85    | -86  | 1        |      |          | 0    |      |      | X         | test X                           |  |   |
| 1 | 7  | -86   | -86  | -86  | 1        |      |          | 0    |      |      | Y         | test Y                           | 1 | 7 | -86  | -86   | -86  | 1        |      |          | 0    |      |      | Y         | test Y                           |  |   |
| 0 | 0  | 14    | -14  | 0    | 0        | 1    | 0        | 1    | 1    | 0    | X plus Y  | test Z for addition              | 0 | 0 | 14   | -14   | 0    | 0        | 1    | 0        | 1    | 1    | 0    | X plus Y  | test Z for addition              |  |   |
| 0 | 0  | 14    | -15  | -1   | 1        | 0    | 0        | 0    | 0    | 1    | X plus Y  | test N for addition              | 0 | 0 | 14   | -15   | -1   | 1        | 0    | 0        | 0    | 0    | 1    | X plus Y  | test N for addition              |  |   |
| 0 | 0  | 14    | 127  | -115 | 1        | 0    | 1        | 0    | 0    | 0    | X plus Y  | test V upwards for addition      | 0 | 0 | 14   | 127   | -115 | 1        | 0    | 1        | 0    | 0    | 0    | X plus Y  | test V upwards for addition      |  |   |
| 0 | 0  | -14   | -127 | 115  | 0        | 1    | 1        | 0    | 1    | 0    | X plus Y  | test V downwards for addition    | 0 | 0 | -14  | -127  | 115  | 0        | 1    | 1        | 0    | 1    | 0    | X plus Y  | test V downwards for addition    |  |   |
| 0 | 1  | 14    | 14   | 0    | 0        | 1    | 0        | 1    |      |      | X minus Y | test Z for subtraction           | 0 | 1 | 14   | 14    | 0    | 0        | 1    | 0        | 1    |      |      | X minus Y | test Z for subtraction           |  |   |
| 0 | 1  | 14    | 15   | -1   | 1        | 0    | 0        | 0    |      |      | X minus Y | test N for subtraction           | 0 | 1 | 14   | 15    | -1   | 1        | 0    | 0        | 0    |      |      | X minus Y | test N for subtraction           |  |   |
| 0 | 1  | 14    | -127 | -115 | 1        | 0    | 1        | 0    |      |      | X minus Y | test V upwards for subtraction   | 0 | 1 | 14   | -127  | -115 | 1        | 0    | 1        | 0    |      |      | X minus Y | test V upwards for subtraction   |  |   |
| 0 | 1  | -14   | 127  | 115  | 0        | 1    | 1        | 0    |      |      | X minus Y | test V downwards for subtraction | 0 | 1 | -14  | 127   | 115  | 0        | 1    | 1        | 0    |      |      | X minus Y | test V downwards for subtraction |  |   |
| 0 | 2  | 127   | 127  | -128 | 1        | 0    | 1        | 0    | 0    | 0    | X plus 1  | test V upwards for increment     | 0 | 2 | 127  | 127   | -128 | 1        | 0    | 1        | 0    | 0    | 0    | X plus 1  | test V upwards for increment     |  |   |
| 0 | 3  | -128  | 127  | 127  | 0        | 1    | 1        | 0    |      |      | X minus 1 | test V downwards for decrement   | 0 | 3 | -128 | 127   | 127  | 0        | 1    | 1        | 0    |      |      | X minus 1 | test V downwards for decrement   |  |   |
| 0 | 4  | 127   | 127  | -2   | 1        | 0    | 1        | 0    | 0    | 0    | X plus X  | test V upwards for doubling      | 0 | 4 | 127  | 127   | -2   | 1        | 0    | 1        | 0    | 0    | 0    | X plus X  | test V upwards for doubling      |  |   |
| 0 | 4  | -128  | 127  | 0    | 0        | 1    | 1        | 1    | 1    | 0    | X plus X  | test V downwards for doubling    | 0 | 4 | -128 | 127   | 0    | 0        | 1    | 1        | 1    | 1    | 0    | X plus X  | test V downwards for doubling    |  |   |
| 0 | 5  | -128  | 127  | -1   | 1        | 1    |          |      |      |      | minus 1   | test N C for -1                  | 0 | 5 | -128 | 127   | -1   | 1        | 1    |          |      |      |      | minus 1   | test N C for -1                  |  |   |
| 0 | 6  | -128  | 127  | 0    |          |      |          |      |      |      | N/A       | test invalid operation           | 0 | 6 | -128 | 127   | 0    |          |      |          |      |      |      | N/A       | test invalid operation           |  |   |
| 0 | 7  | -128  | 127  | 0    |          |      |          |      |      |      | N/A       | test invalid operation           | 0 | 7 | -128 | 127   | 0    |          |      |          |      |      |      | N/A       | test invalid operation           |  |   |
| 9 | 64 | -1104 | 1483 | -182 | 9        | 7    | 8        | 3    | 3    | 1    | 0         |                                  | 0 | 9 | 64   | -1104 | 1483 | -182     | 9    | 7        | 8    | 3    | 3    | 1         | 0                                |  | 0 |

| M | F  | X     | Y    | S    | Negative | Cout | Overflow | Zero | Gout | Pout | Comment   | Purpose                          | M | F | X    | Y     | S    | Negative | Cout | Overflow | Zero | Gout | Pout | Comment   | Purpose                          |  |
|---|----|-------|------|------|----------|------|----------|------|------|------|-----------|----------------------------------|---|---|------|-------|------|----------|------|----------|------|------|------|-----------|----------------------------------|--|
| 1 | 1  | -86   | 85   | -1   |          |      |          |      |      |      | X nand Y  | test nand                        | 1 | 1 | -86  | 85    | -1   |          |      |          |      |      |      | X nand Y  | test nand                        |  |
| 1 | 0  | -86   | 85   | 0    |          |      |          |      |      |      | X and Y   | test and                         | 1 | 0 | -86  | 85    | 0    |          |      |          |      |      |      | X and Y   | test and                         |  |
| 1 | 1  | -86   | 85   | -1   |          |      |          |      |      |      | X nand Y  | test nand                        | 1 | 1 | -86  | 85    | -1   |          |      |          |      |      |      | X nand Y  | test nand                        |  |
| 1 | 2  | -86   | 85   | -1   |          |      |          |      |      |      | X or Y    | test or                          | 1 | 2 | -86  | 85    | -1   |          |      |          |      |      |      | X or Y    | test or                          |  |
| 1 | 3  | -86   | 85   | 0    |          |      |          |      |      |      | X nor Y   | test nor                         | 1 | 3 | -86  | 85    | 0    |          |      |          |      |      |      | X nor Y   | test nor                         |  |
| 1 | 4  | -86   | 85   | -1   |          |      |          |      |      |      | X xor Y   | test xor                         | 1 | 4 | -86  | 85    | -1   |          |      |          |      |      |      | X xor Y   | test xor                         |  |
| 1 | 5  | -86   | 85   | 0    |          |      |          |      |      |      | X xnor Y  | test xnor                        | 1 | 5 | -86  | 85    | 0    |          |      |          |      |      |      | X xnor Y  | test xnor                        |  |
| 1 | 6  | -86   | 85   | -86  | 1        |      |          | 0    |      |      | X         | test X                           | 1 | 6 | -86  | 85    | -86  |          |      |          | 0    |      |      | X         | test X                           |  |
| 1 | 7  | -86   | -86  | -86  | 1        |      |          | 0    |      |      | Y         | test Y                           | 1 | 7 | -86  | -86   | -86  | 1        |      |          | 0    |      |      | Y         | test Y                           |  |
| 0 | 0  | 14    | -14  | 0    | 0        | 1    | 0        | 0    | 1    | 0    | X plus Y  | test Z for addition              | 0 | 0 | 14   | -14   | 0    | 0        | 1    | 0        | 1    | 1    | 0    | X plus Y  | test Z for addition              |  |
| 0 | 0  | 14    | -15  | -1   | 1        | 0    | 0        | 1    | 0    | 1    | X plus Y  | test N for addition              | 0 | 0 | 14   | -15   | -1   | 1        | 0    | 0        | 0    | 0    | 1    | X plus Y  | test N for addition              |  |
| 0 | 0  | 14    | 127  | -115 | 1        | 0    | 1        | 0    | 0    | 0    | X plus Y  | test V upwards for addition      | 0 | 0 | 14   | 127   | -115 | 1        | 0    | 1        | 0    | 0    | 0    | X plus Y  | test V upwards for addition      |  |
| 0 | 0  | -14   | -127 | 115  | 0        | 1    | 1        | 0    | 1    | 0    | X plus Y  | test V downwards for addition    | 0 | 0 | -14  | -127  | 115  | 0        | 1    | 1        | 0    | 1    | 0    | X plus Y  | test V downwards for addition    |  |
| 0 | 1  | 14    | 14   | 0    | 0        | 1    | 0        | 0    | 0    |      | X minus Y | test Z for subtraction           | 0 | 1 | 14   | 14    | 0    | 0        | 1    | 0        | 1    |      |      | X minus Y | test Z for subtraction           |  |
| 0 | 1  | 14    | 15   | -1   | 1        | 0    | 0        | 1    | 0    |      | X minus Y | test N for subtraction           | 0 | 1 | 14   | 15    | -1   | 1        | 0    | 0        | 0    |      |      | X minus Y | test N for subtraction           |  |
| 0 | 1  | 14    | -127 | -115 | 1        | 0    | 1        | 0    | 0    |      | X minus Y | test V upwards for subtraction   | 0 | 1 | 14   | -127  | -115 | 1        | 0    | 1        | 0    |      |      | X minus Y | test V upwards for subtraction   |  |
| 0 | 1  | -14   | 127  | 115  | 0        | 1    | 1        | 0    | 0    |      | X minus Y | test V downwards for subtraction | 0 | 1 | -14  | 127   | 115  | 0        | 1    | 1        | 0    |      |      | X minus Y | test V downwards for subtraction |  |
| 0 | 2  | 127   | 127  | -128 | 1        | 0    | 1        | 0    | 0    | 0    | X plus 1  | test V upwards for increment     | 0 | 2 | 127  | 127   | -128 | 1        | 0    | 1        | 0    | 0    | 0    | X plus 1  | test V upwards for increment     |  |
| 0 | 3  | -128  | 127  | -127 | 1        | 0    | 0        | 0    | 0    | 0    | X minus 1 | test V downwards for decrement   | 0 | 3 | -128 | 127   | 127  | 0        | 1    | 1        | 0    |      |      | X minus 1 | test V downwards for decrement   |  |
| 0 | 4  | 127   | 127  | -2   | 1        | 0    | 1        | 0    | 0    | 0    | X plus X  | test V upwards for doubling      | 0 | 4 | 127  | 127   | -2   | 1        | 0    | 1        | 0    | 0    | 0    | X plus X  | test V upwards for doubling      |  |
| 0 | 4  | -128  | 127  | 0    | 0        | 1    | 1        | 0    | 1    | 0    | X plus X  | test V downwards for doubling    | 0 | 4 | -128 | 127   | 0    | 0        | 1    | 1        | 1    | 1    | 0    | X plus X  | test V downwards for doubling    |  |
| 0 | 5  | -128  | 127  | 0    | 1        | 1    |          |      |      |      | minus 1   | test N C for -1                  | 0 | 5 | -128 | 127   | -1   | 1        | 1    |          |      |      |      | minus 1   | test N C for -1                  |  |
| 0 | 6  | -128  | 127  | -1   |          |      |          |      |      |      | N/A       | test invalid operation           | 0 | 6 | -128 | 127   | 0    |          |      |          |      |      |      | N/A       | test invalid operation           |  |
| 0 | 7  | -128  | 127  | -1   |          |      |          |      |      |      | N/A       | test invalid operation           | 0 | 7 | -128 | 127   | 0    |          |      |          |      |      |      | N/A       | test invalid operation           |  |
| 9 | 64 | -1104 | 1483 | -437 | 10       | 6    | 7        | 2    | 3    | 1    | 0         |                                  | 0 | 9 | 64   | -1104 | 1483 | -182     | 9    | 7        | 8    | 3    | 3    | 1         | 0                                |  |

| M | F  | X     | Y    | S    | Negative | Cout | Overflow | Zero | Gout | Pout | Comment   | Purpose                          | M | F | X    | Y     | S    | Negative | Cout | Overflow | Zero | Gout | Pout | Comment   | Purpose                          |  |   |
|---|----|-------|------|------|----------|------|----------|------|------|------|-----------|----------------------------------|---|---|------|-------|------|----------|------|----------|------|------|------|-----------|----------------------------------|--|---|
| 1 | 1  | -86   | 85   | -1   |          |      |          |      |      |      | X nand Y  | test nand                        | 1 | 1 | -86  | 85    | -1   |          |      |          |      |      |      | X nand Y  | test nand                        |  |   |
| 1 | 0  | -86   | 85   | 0    |          |      |          |      |      |      | X and Y   | test and                         | 1 | 0 | -86  | 85    | 0    |          |      |          |      |      |      | X and Y   | test and                         |  |   |
| 1 | 1  | -86   | 85   | -1   |          |      |          |      |      |      | X nand Y  | test nand                        | 1 | 1 | -86  | 85    | -1   |          |      |          |      |      |      | X nand Y  | test nand                        |  |   |
| 1 | 2  | -86   | 85   | -1   |          |      |          |      |      |      | X or Y    | test or                          | 1 | 2 | -86  | 85    | -1   |          |      |          |      |      |      | X or Y    | test or                          |  |   |
| 1 | 3  | -86   | 85   | 0    |          |      |          |      |      |      | X nor Y   | test nor                         | 1 | 3 | -86  | 85    | 0    |          |      |          |      |      |      | X nor Y   | test nor                         |  |   |
| 1 | 4  | -86   | 85   | -1   |          |      |          |      |      |      | X xor Y   | test xor                         | 1 | 4 | -86  | 85    | -1   |          |      |          |      |      |      | X xor Y   | test xor                         |  |   |
| 1 | 5  | -86   | 85   | 0    |          |      |          |      |      |      | X xnor Y  | test xnor                        | 1 | 5 | -86  | 85    | 0    |          |      |          |      |      |      | X xnor Y  | test xnor                        |  |   |
| 1 | 6  | -86   | 85   | -86  | 1        |      |          | 0    |      |      | X         | test X                           | 1 | 6 | -86  | 85    | -86  |          |      |          | 0    |      |      | X         | test X                           |  |   |
| 1 | 7  | -86   | -86  | -86  | 1        |      |          | 0    |      |      | Y         | test Y                           | 1 | 7 | -86  | -86   | -86  | 1        |      |          | 0    |      |      | Y         | test Y                           |  |   |
| 0 | 0  | 14    | -14  | 0    | 0        | 1    | 0        | 1    | 1    | 0    | X plus Y  | test Z for addition              | 0 | 0 | 14   | -14   | 0    | 0        | 1    | 0        | 1    | 1    | 0    | X plus Y  | test Z for addition              |  |   |
| 0 | 0  | 14    | -15  | -1   | 1        | 0    | 0        | 0    | 0    | 1    | X plus Y  | test N for addition              | 0 | 0 | 14   | -15   | -1   | 1        | 0    | 0        | 0    | 0    | 1    | X plus Y  | test N for addition              |  |   |
| 0 | 0  | 14    | 127  | -115 | 1        | 0    | 1        | 0    | 0    | 0    | X plus Y  | test V upwards for addition      | 0 | 0 | 14   | 127   | -115 | 1        | 0    | 1        | 0    | 0    | 0    | X plus Y  | test V upwards for addition      |  |   |
| 0 | 0  | -14   | -127 | 115  | 0        | 1    | 1        | 0    | 1    | 0    | X plus Y  | test V downwards for addition    | 0 | 0 | -14  | -127  | 115  | 0        | 1    | 1        | 0    | 1    | 0    | X plus Y  | test V downwards for addition    |  |   |
| 0 | 1  | 14    | 14   | 0    | 0        | 1    | 0        | 1    |      |      | X minus Y | test Z for subtraction           | 0 | 1 | 14   | 14    | 0    | 0        | 1    | 0        | 1    |      |      | X minus Y | test Z for subtraction           |  |   |
| 0 | 1  | 14    | 15   | -1   | 1        | 0    | 0        | 0    |      |      | X minus Y | test N for subtraction           | 0 | 1 | 14   | 15    | -1   | 1        | 0    | 0        | 0    |      |      | X minus Y | test N for subtraction           |  |   |
| 0 | 1  | 14    | -127 | -115 | 1        | 0    | 1        | 0    |      |      | X minus Y | test V upwards for subtraction   | 0 | 1 | 14   | -127  | -115 | 1        | 0    | 1        | 0    |      |      | X minus Y | test V upwards for subtraction   |  |   |
| 0 | 1  | -14   | 127  | 115  | 0        | 1    | 1        | 0    |      |      | X minus Y | test V downwards for subtraction | 0 | 1 | -14  | 127   | 115  | 0        | 1    | 1        | 0    |      |      | X minus Y | test V downwards for subtraction |  |   |
| 0 | 2  | 127   | 127  | -128 | 1        | 0    | 1        | 0    | 0    | 0    | X plus 1  | test V upwards for increment     | 0 | 2 | 127  | 127   | -128 | 1        | 0    | 1        | 0    | 0    | 0    | X plus 1  | test V upwards for increment     |  |   |
| 0 | 3  | -128  | 127  | 127  | 0        | 1    | 1        | 0    |      |      | X minus 1 | test V downwards for decrement   | 0 | 3 | -128 | 127   | 127  | 0        | 1    | 1        | 0    |      |      | X minus 1 | test V downwards for decrement   |  |   |
| 0 | 4  | 127   | 127  | -2   | 1        | 0    | 1        | 0    | 0    | 0    | X plus X  | test V upwards for doubling      | 0 | 4 | 127  | 127   | -2   | 1        | 0    | 1        | 0    | 0    | 0    | X plus X  | test V upwards for doubling      |  |   |
| 0 | 4  | -128  | 127  | 0    | 0        | 1    | 1        | 1    | 1    | 0    | X plus X  | test V downwards for doubling    | 0 | 4 | -128 | 127   | 0    | 0        | 1    | 1        | 1    | 1    | 0    | X plus X  | test V downwards for doubling    |  |   |
| 0 | 5  | -128  | 127  | -1   | 1        | 1    |          |      |      |      | minus 1   | test N C for -1                  | 0 | 5 | -128 | 127   | -1   | 1        | 1    |          |      |      |      | minus 1   | test N C for -1                  |  |   |
| 0 | 6  | -128  | 127  | 0    |          |      |          |      |      |      | N/A       | test invalid operation           | 0 | 6 | -128 | 127   | 0    |          |      |          |      |      |      | N/A       | test invalid operation           |  |   |
| 0 | 7  | -128  | 127  | 0    |          |      |          |      |      |      | N/A       | test invalid operation           | 0 | 7 | -128 | 127   | 0    |          |      |          |      |      |      | N/A       | test invalid operation           |  |   |
| 9 | 64 | -1104 | 1483 | -182 | 9        | 7    | 8        | 3    | 3    | 1    | 0         |                                  | 0 | 9 | 64   | -1104 | 1483 | -182     | 9    | 7        | 8    | 3    | 3    | 1         | 0                                |  | 0 |

| M | F  | X     | Y    | S    | Negative | Cout | Overflow | Zero | Gout | Pout | Comment   | Purpose                          | M | F | X    | Y     | S    | Negative | Cout | Overflow | Zero | Gout | Pout | Comment | Purpose   |                                  |   |
|---|----|-------|------|------|----------|------|----------|------|------|------|-----------|----------------------------------|---|---|------|-------|------|----------|------|----------|------|------|------|---------|-----------|----------------------------------|---|
| 1 | 1  | -86   | 85   | -1   |          |      |          |      |      |      | X nand Y  | test nand                        | 1 | 1 | -86  | 85    | -1   |          |      |          |      |      |      |         | X nand Y  | test nand                        |   |
| 1 | 0  | -86   | 85   | 0    |          |      |          |      |      |      | X and Y   | test and                         | 1 | 0 | -86  | 85    | 0    |          |      |          |      |      |      |         | X and Y   | test and                         |   |
| 1 | 1  | -86   | 85   | -1   |          |      |          |      |      |      | X nand Y  | test nand                        | 1 | 1 | -86  | 85    | -1   |          |      |          |      |      |      |         | X nand Y  | test nand                        |   |
| 1 | 2  | -86   | 85   | -1   |          |      |          |      |      |      | X or Y    | test or                          | 1 | 2 | -86  | 85    | -1   |          |      |          |      |      |      |         | X or Y    | test or                          |   |
| 1 | 3  | -86   | 85   | 0    |          |      |          |      |      |      | X nor Y   | test nor                         | 1 | 3 | -86  | 85    | 0    |          |      |          |      |      |      |         | X nor Y   | test nor                         |   |
| 1 | 4  | -86   | 85   | -1   |          |      |          |      |      |      | X xor Y   | test xor                         | 1 | 4 | -86  | 85    | -1   |          |      |          |      |      |      |         | X xor Y   | test xor                         |   |
| 1 | 5  | -86   | 85   | 0    |          |      |          |      |      |      | X xnor Y  | test xnor                        | 1 | 5 | -86  | 85    | 0    |          |      |          |      |      |      |         | X xnor Y  | test xnor                        |   |
| 1 | 6  | -86   | 85   | -86  | 1        |      |          | 0    |      |      | X         | test X                           | 1 | 6 | -86  | 85    | -86  | 1        |      |          | 0    |      |      | X       | test X    |                                  |   |
| 1 | 7  | -86   | -86  | -86  | 1        |      |          | 0    |      |      | Y         | test Y                           | 1 | 7 | -86  | -86   | -86  | 1        |      |          | 0    |      |      | Y       | test Y    |                                  |   |
| 0 | 0  | 14    | -14  | 0    | 0        | 1    | 0        | 1    | 1    | 0    | X plus Y  | test Z for addition              | 0 | 0 | 14   | -14   | 0    | 0        | 1    | 0        | 0    | 1    | 1    | 0       | X plus Y  | test Z for addition              |   |
| 0 | 0  | 14    | -15  | -1   | 1        | 0    | 0        | 0    | 0    | 0    | X plus Y  | test N for addition              | 0 | 0 | 14   | -15   | -1   | 1        | 0    | 0        | 0    | 0    | 0    | 1       | X plus Y  | test N for addition              |   |
| 0 | 0  | 14    | 127  | -115 | 1        | 0    | 1        | 0    | 0    | 0    | X plus Y  | test V upwards for addition      | 0 | 0 | 14   | 127   | -115 | 1        | 0    | 1        | 0    | 0    | 0    | 0       | X plus Y  | test V upwards for addition      |   |
| 0 | 0  | -14   | -127 | 115  | 0        | 1    | 1        | 0    | 1    | 0    | X plus Y  | test V downwards for addition    | 0 | 0 | -14  | -127  | 115  | 0        | 1    | 1        | 0    | 1    | 0    | 0       | X plus Y  | test V downwards for addition    |   |
| 0 | 1  | 14    | 14   | 0    | 0        | 1    | 0        | 1    |      |      | X minus Y | test Z for subtraction           | 0 | 1 | 14   | 14    | 0    | 0        | 1    | 0        | 1    |      |      |         | X minus Y | test Z for subtraction           |   |
| 0 | 1  | 14    | 15   | -1   | 1        | 0    | 0        | 0    |      |      | X minus Y | test N for subtraction           | 0 | 1 | 14   | 15    | -1   | 1        | 0    | 0        | 0    |      |      |         | X minus Y | test N for subtraction           |   |
| 0 | 1  | 14    | -127 | -115 | 1        | 0    | 1        | 0    |      |      | X minus Y | test V upwards for subtraction   | 0 | 1 | 14   | -127  | -115 | 1        | 0    | 1        | 0    |      |      |         | X minus Y | test V upwards for subtraction   |   |
| 0 | 1  | -14   | 127  | 115  | 0        | 1    | 1        | 0    |      |      | X minus Y | test V downwards for subtraction | 0 | 1 | -14  | 127   | 115  | 0        | 1    | 1        | 0    |      |      |         | X minus Y | test V downwards for subtraction |   |
| 0 | 2  | 127   | 127  | -128 | 1        | 0    | 1        | 0    | 0    | 0    | X plus 1  | test V upwards for increment     | 0 | 2 | 127  | 127   | -128 | 1        | 0    | 1        | 0    | 0    | 0    | 0       | X plus 1  | test V upwards for increment     |   |
| 0 | 3  | -128  | 127  | 127  | 0        | 1    | 1        | 0    |      |      | X minus 1 | test V downwards for decrement   | 0 | 3 | -128 | 127   | 127  | 0        | 1    | 1        | 0    |      |      |         | X minus 1 | test V downwards for decrement   |   |
| 0 | 4  | 127   | 127  | -2   | 1        | 0    | 1        | 0    | 0    | 0    | X plus X  | test V upwards for doubling      | 0 | 4 | 127  | 127   | -2   | 1        | 0    | 1        | 0    | 0    | 0    | 0       | X plus X  | test V upwards for doubling      |   |
| 0 | 4  | -128  | 127  | 0    | 0        | 1    | 1        | 1    | 1    | 0    | X plus X  | test V downwards for doubling    | 0 | 4 | -128 | 127   | 0    | 0        | 1    | 1        | 1    | 1    | 1    | 0       | X plus X  | test V downwards for doubling    |   |
| 0 | 5  | -128  | 127  | -1   | 1        | 1    |          |      |      |      | minus 1   | test N C for -1                  | 0 | 5 | -128 | 127   | -1   | 1        | 1    |          |      |      |      |         | minus 1   | test N C for -1                  |   |
| 0 | 6  | -128  | 127  | 0    |          |      |          |      |      |      | N/A       | test invalid operation           | 0 | 6 | -128 | 127   | 0    |          |      |          |      |      |      |         | N/A       | test invalid operation           |   |
| 0 | 7  | -128  | 127  | 0    |          |      |          |      |      |      | N/A       | test invalid operation           | 0 | 7 | -128 | 127   | 0    |          |      |          |      |      |      |         | N/A       | test invalid operation           |   |
| 9 | 64 | -1104 | 1483 | -182 | 9        | 7    | 8        | 3    | 3    | 1    | 0         |                                  | 0 | 9 | 64   | -1104 | 1483 | -182     | 9    | 7        | 8    | 3    | 3    | 1       | 0         |                                  | 0 |

| M | F  | X     | Y    | S    | Negative | Cout | Overflow | Zero | Gout | Pout | Comment   | Purpose                          | M | F | X    | Y     | S    | Negative | Cout | Overflow | Zero | Gout | Pout | Comment   | Purpose                          |                     |   |
|---|----|-------|------|------|----------|------|----------|------|------|------|-----------|----------------------------------|---|---|------|-------|------|----------|------|----------|------|------|------|-----------|----------------------------------|---------------------|---|
| 1 | 1  | -86   | 85   | -1   |          |      |          |      |      |      | X nand Y  | test nand                        | 1 | 1 | -86  | 85    | -1   |          |      |          |      |      |      | X nand Y  | test nand                        |                     |   |
| 1 | 0  | -86   | 85   | 0    |          |      |          |      |      |      | X and Y   | test and                         | 1 | 0 | -86  | 85    | 0    |          |      |          |      |      |      | X and Y   | test and                         |                     |   |
| 1 | 1  | -86   | 85   | -1   |          |      |          |      |      |      | X nand Y  | test nand                        | 1 | 1 | -86  | 85    | -1   |          |      |          |      |      |      | X nand Y  | test nand                        |                     |   |
| 1 | 2  | -86   | 85   | -1   |          |      |          |      |      |      | X or Y    | test or                          | 1 | 2 | -86  | 85    | -1   |          |      |          |      |      |      | X or Y    | test or                          |                     |   |
| 1 | 3  | -86   | 85   | 0    |          |      |          |      |      |      | X nor Y   | test nor                         | 1 | 3 | -86  | 85    | 0    |          |      |          |      |      |      | X nor Y   | test nor                         |                     |   |
| 1 | 4  | -86   | 85   | -1   |          |      |          |      |      |      | X xor Y   | test xor                         | 1 | 4 | -86  | 85    | -1   |          |      |          |      |      |      | X xor Y   | test xor                         |                     |   |
| 1 | 5  | -86   | 85   | 0    |          |      |          |      |      |      | X xnor Y  | test xnor                        | 1 | 5 | -86  | 85    | 0    |          |      |          |      |      |      | X xnor Y  | test xnor                        |                     |   |
| 1 | 6  | -86   | 85   | -86  | 1        |      |          | 0    |      |      | X         | test X                           | 1 | 6 | -86  | 85    | -86  | 1        |      |          | 0    |      |      | X         | test X                           |                     |   |
| 1 | 7  | -86   | -86  | -86  | 1        |      |          | 0    |      |      | Y         | test Y                           | 1 | 7 | -86  | -86   | -86  | 1        |      |          | 0    |      |      | Y         | test Y                           |                     |   |
| 0 | 0  | 14    | -14  | 0    | 0        | 1    | 0        | 1    | 1    | 0    | X plus Y  | test Z for addition              | 0 | 0 | 14   | -14   | 0    | 0        | 1    | 0        | 0    | 1    | 0    | X plus Y  | test Z for addition              |                     |   |
| 0 | 0  | 14    | -15  | -1   | 1        | 0    | 0        | 0    | U    | 1    | X plus Y  | test N for addition              | 0 | 0 | 14   | -15   | -1   | 1        | 0    | 0        | 0    | 0    | 0    | 1         | X plus Y                         | test N for addition |   |
| 0 | 0  | 14    | 127  | -115 | 1        | 0    | 1        | 0    | U    | 0    | X plus Y  | test V upwards for addition      | 0 | 0 | 14   | 127   | -115 | 1        | 0    | 1        | 0    | 0    | 0    | X plus Y  | test V upwards for addition      |                     |   |
| 0 | 0  | -14   | -127 | 115  | 0        | 1    | 1        | 0    | 1    | 0    | X plus Y  | test V downwards for addition    | 0 | 0 | -14  | -127  | 115  | 0        | 1    | 1        | 0    | 1    | 0    | X plus Y  | test V downwards for addition    |                     |   |
| 0 | 1  | 14    | 14   | 0    | 0        | 1    | 0        | 1    |      |      | X minus Y | test Z for subtraction           | 0 | 1 | 14   | 14    | 0    | 0        | 1    | 0        | 1    |      |      | X minus Y | test Z for subtraction           |                     |   |
| 0 | 1  | 14    | 15   | -1   | 1        | 0    | 0        | 0    |      |      | X minus Y | test N for subtraction           | 0 | 1 | 14   | 15    | -1   | 1        | 0    | 0        | 0    |      |      | X minus Y | test N for subtraction           |                     |   |
| 0 | 1  | 14    | -127 | -115 | 1        | 0    | 1        | 0    |      |      | X minus Y | test V upwards for subtraction   | 0 | 1 | 14   | -127  | -115 | 1        | 0    | 1        | 0    |      |      | X minus Y | test V upwards for subtraction   |                     |   |
| 0 | 1  | -14   | 127  | 115  | 0        | 1    | 1        | 0    |      |      | X minus Y | test V downwards for subtraction | 0 | 1 | -14  | 127   | 115  | 0        | 1    | 1        | 0    |      |      | X minus Y | test V downwards for subtraction |                     |   |
| 0 | 2  | 127   | 127  | -128 | 1        | 0    | 1        | 0    | U    | 0    | X plus 1  | test V upwards for increment     | 0 | 2 | 127  | 127   | -128 | 1        | 0    | 1        | 0    | 0    | 0    | X plus 1  | test V upwards for increment     |                     |   |
| 0 | 3  | -128  | 127  | 127  | 0        | 1    | 1        | 0    |      |      | X minus 1 | test V downwards for decrement   | 0 | 3 | -128 | 127   | 127  | 0        | 1    | 1        | 0    |      |      | X minus 1 | test V downwards for decrement   |                     |   |
| 0 | 4  | 127   | 127  | -2   | 1        | 0    | 1        | 0    | U    | 0    | X plus X  | test V upwards for doubling      | 0 | 4 | 127  | 127   | -2   | 1        | 0    | 1        | 0    | 0    | 0    | X plus X  | test V upwards for doubling      |                     |   |
| 0 | 4  | -128  | 127  | 0    | 0        | 1    | 1        | 1    | 1    | 0    | X plus X  | test V downwards for doubling    | 0 | 4 | -128 | 127   | 0    | 0        | 1    | 1        | 1    | 1    | 0    | X plus X  | test V downwards for doubling    |                     |   |
| 0 | 5  | -128  | 127  | -1   | 1        | 1    |          |      |      |      | minus 1   | test N C for -1                  | 0 | 5 | -128 | 127   | -1   | 1        | 1    |          |      |      |      | minus 1   | test N C for -1                  |                     |   |
| 0 | 6  | -128  | 127  | 0    |          |      |          |      |      |      | N/A       | test invalid operation           | 0 | 6 | -128 | 127   | 0    |          |      |          |      |      |      | N/A       | test invalid operation           |                     |   |
| 0 | 7  | -128  | 127  | 0    |          |      |          |      |      |      | N/A       | test invalid operation           | 0 | 7 | -128 | 127   | 0    |          |      |          |      |      |      | N/A       | test invalid operation           |                     |   |
| 9 | 64 | -1104 | 1483 | -182 | 9        | 7    | 8        | 3    | 3    | 1    | 0         |                                  | 0 | 9 | 64   | -1104 | 1483 | -182     | 9    | 7        | 8    | 3    | 3    | 1         | 0                                |                     | 0 |

| M | F  | X     | Y    | S    | Negative | Cout | Overflow | Zero | Gout | Pout | Comment   | Purpose                          | M | F | X    | Y     | S    | Negative | Cout | Overflow | Zero | Gout | Pout | Comment   | Purpose                          |                               |   |
|---|----|-------|------|------|----------|------|----------|------|------|------|-----------|----------------------------------|---|---|------|-------|------|----------|------|----------|------|------|------|-----------|----------------------------------|-------------------------------|---|
| 1 | 1  | -86   | 85   | -1   |          |      |          |      |      |      | X nand Y  | test nand                        | 1 | 1 | -86  | 85    | -1   |          |      |          |      |      |      | X nand Y  | test nand                        |                               |   |
| 1 | 0  | -86   | 85   | 0    |          |      |          |      |      |      | X and Y   | test and                         | 1 | 0 | -86  | 85    | 0    |          |      |          |      |      |      | X and Y   | test and                         |                               |   |
| 1 | 1  | -86   | 85   | -1   |          |      |          |      |      |      | X nand Y  | test nand                        | 1 | 1 | -86  | 85    | -1   |          |      |          |      |      |      | X nand Y  | test nand                        |                               |   |
| 1 | 2  | -86   | 85   | -1   |          |      |          |      |      |      | X or Y    | test or                          | 1 | 2 | -86  | 85    | -1   |          |      |          |      |      |      | X or Y    | test or                          |                               |   |
| 1 | 3  | -86   | 85   | 0    |          |      |          |      |      |      | X nor Y   | test nor                         | 1 | 3 | -86  | 85    | 0    |          |      |          |      |      |      | X nor Y   | test nor                         |                               |   |
| 1 | 4  | -86   | 85   | -1   |          |      |          |      |      |      | X xor Y   | test xor                         | 1 | 4 | -86  | 85    | -1   |          |      |          |      |      |      | X xor Y   | test xor                         |                               |   |
| 1 | 5  | -86   | 85   | 0    |          |      |          |      |      |      | X xnor Y  | test xnor                        | 1 | 5 | -86  | 85    | 0    |          |      |          |      |      |      | X xnor Y  | test xnor                        |                               |   |
| 1 | 6  | -86   | 85   | -86  | 1        |      |          | 0    |      |      | X         | test X                           | 1 | 6 | -86  | 85    | -86  | 1        |      |          | 0    |      |      | X         | test X                           |                               |   |
| 1 | 7  | -86   | -86  | -86  | 1        |      |          | 0    |      |      | Y         | test Y                           | 1 | 7 | -86  | -86   | -86  | 1        |      |          | 0    |      |      | Y         | test Y                           |                               |   |
| 0 | 0  | 14    | -14  | 0    | 0        | 1    | 0        | 1    | 1    | 0    | X plus Y  | test Z for addition              | 0 | 0 | 14   | -14   | 0    | 0        | 1    | 0        | 0    | 1    | 1    | 0         | X plus Y                         | test Z for addition           |   |
| 0 | 0  | 14    | -15  | -1   | 1        | 0    | 0        | 0    | 0    | 1    | X plus Y  | test N for addition              | 0 | 0 | 14   | -15   | -1   | 1        | 0    | 0        | 0    | 0    | 0    | 1         | X plus Y                         | test N for addition           |   |
| 0 | 0  | 14    | 127  | -115 | 1        | 0    | 1        | 0    | 0    | 1    | X plus Y  | test V upwards for addition      | 0 | 0 | 14   | 127   | -115 | 1        | 0    | 1        | 0    | 0    | 0    | 1         | X plus Y                         | test V upwards for addition   |   |
| 0 | 0  | -14   | -127 | 115  | 0        | 1    | 1        | 0    | 1    | 0    | X plus Y  | test V downwards for addition    | 0 | 0 | -14  | -127  | 115  | 0        | 1    | 1        | 0    | 1    | 0    | 1         | X plus Y                         | test V downwards for addition |   |
| 0 | 1  | 14    | 14   | 0    | 0        | 1    | 0        | 1    |      |      | X minus Y | test Z for subtraction           | 0 | 1 | 14   | 14    | 0    | 0        | 1    | 0        | 1    |      |      | X minus Y | test Z for subtraction           |                               |   |
| 0 | 1  | 14    | 15   | -1   | 1        | 0    | 0        | 0    |      |      | X minus Y | test N for subtraction           | 0 | 1 | 14   | 15    | -1   | 1        | 0    | 0        | 0    |      |      | X minus Y | test N for subtraction           |                               |   |
| 0 | 1  | 14    | -127 | -115 | 1        | 0    | 1        | 0    |      |      | X minus Y | test V upwards for subtraction   | 0 | 1 | 14   | -127  | -115 | 1        | 0    | 1        | 0    |      |      | X minus Y | test V upwards for subtraction   |                               |   |
| 0 | 1  | -14   | 127  | 115  | 0        | 1    | 1        | 0    |      |      | X minus Y | test V downwards for subtraction | 0 | 1 | -14  | 127   | 115  | 0        | 1    | 1        | 0    |      |      | X minus Y | test V downwards for subtraction |                               |   |
| 0 | 2  | 127   | 127  | -128 | 1        | 0    | 1        | 0    | 0    | 1    | X plus 1  | test V upwards for increment     | 0 | 2 | 127  | 127   | -128 | 1        | 0    | 1        | 0    | 0    | 0    | 1         | X plus 1                         | test V upwards for increment  |   |
| 0 | 3  | -128  | 127  | 127  | 0        | 1    | 1        | 0    |      |      | X minus 1 | test V downwards for decrement   | 0 | 3 | -128 | 127   | 127  | 0        | 1    | 1        | 0    |      |      | X minus 1 | test V downwards for decrement   |                               |   |
| 0 | 4  | 127   | 127  | -2   | 1        | 0    | 1        | 0    | 0    | 1    | X plus X  | test V upwards for doubling      | 0 | 4 | 127  | 127   | -2   | 1        | 0    | 1        | 0    | 0    | 0    | 1         | X plus X                         | test V upwards for doubling   |   |
| 0 | 4  | -128  | 127  | 0    | 0        | 1    | 1        | 1    | 1    | 0    | X plus X  | test V downwards for doubling    | 0 | 4 | -128 | 127   | 0    | 0        | 1    | 1        | 1    | 1    | 0    | 1         | X plus X                         | test V downwards for doubling |   |
| 0 | 5  | -128  | 127  | -1   | 1        | 1    |          |      |      |      | minus 1   | test N C for -1                  | 0 | 5 | -128 | 127   | -1   | 1        | 1    |          |      |      |      | minus 1   | test N C for -1                  |                               |   |
| 0 | 6  | -128  | 127  | 0    |          |      |          |      |      |      | N/A       | test invalid operation           | 0 | 6 | -128 | 127   | 0    |          |      |          |      |      |      | N/A       | test invalid operation           |                               |   |
| 0 | 7  | -128  | 127  | 0    |          |      |          |      |      |      | N/A       | test invalid operation           | 0 | 7 | -128 | 127   | 0    |          |      |          |      |      |      | N/A       | test invalid operation           |                               |   |
| 9 | 64 | -1104 | 1483 | -182 | 9        | 7    | 8        | 3    | 3    | 1    | 0         |                                  | 0 | 9 | 64   | -1104 | 1483 | -182     | 9    | 7        | 8    | 3    | 3    | 1         | 0                                |                               | 0 |

| M | F  | X     | Y    | S    | Negative | Cout | Overflow | Zero | Gout | Pout | Comment   | Purpose                          | M | F | X    | Y     | S    | Negative | Cout | Overflow | Zero | Gout | Pout | Comment | Purpose   |                                  |   |
|---|----|-------|------|------|----------|------|----------|------|------|------|-----------|----------------------------------|---|---|------|-------|------|----------|------|----------|------|------|------|---------|-----------|----------------------------------|---|
| 1 | 1  | -86   | 85   | -1   |          |      |          |      |      |      | X nand Y  | test nand                        | 1 | 1 | -86  | 85    | -1   |          |      |          |      |      |      |         | X nand Y  | test nand                        |   |
| 1 | 0  | -86   | 85   | 0    |          |      |          |      |      |      | X and Y   | test and                         | 1 | 0 | -86  | 85    | 0    |          |      |          |      |      |      |         | X and Y   | test and                         |   |
| 1 | 1  | -86   | 85   | -1   |          |      |          |      |      |      | X nand Y  | test nand                        | 1 | 1 | -86  | 85    | -1   |          |      |          |      |      |      |         | X nand Y  | test nand                        |   |
| 1 | 2  | -86   | 85   | -1   |          |      |          |      |      |      | X or Y    | test or                          | 1 | 2 | -86  | 85    | -1   |          |      |          |      |      |      |         | X or Y    | test or                          |   |
| 1 | 3  | -86   | 85   | 0    |          |      |          |      |      |      | X nor Y   | test nor                         | 1 | 3 | -86  | 85    | 0    |          |      |          |      |      |      |         | X nor Y   | test nor                         |   |
| 1 | 4  | -86   | 85   | -1   |          |      |          |      |      |      | X xor Y   | test xor                         | 1 | 4 | -86  | 85    | -1   |          |      |          |      |      |      |         | X xor Y   | test xor                         |   |
| 1 | 5  | -86   | 85   | 0    |          |      |          |      |      |      | X xnor Y  | test xnor                        | 1 | 5 | -86  | 85    | 0    |          |      |          |      |      |      |         | X xnor Y  | test xnor                        |   |
| 1 | 6  | -86   | 85   | -86  | 1        |      |          | 0    |      |      | X         | test X                           | 1 | 6 | -86  | 85    | -86  | 1        |      |          | 0    |      |      |         | X         | test X                           |   |
| 1 | 7  | -86   | -86  | -86  | 1        |      |          | 0    |      |      | Y         | test Y                           | 1 | 7 | -86  | -86   | -86  | 1        |      |          | 0    |      |      |         | Y         | test Y                           |   |
| 0 | 0  | 14    | -14  | 0    | 0        | 1    | 0        | 1    | 1    | 0    | X plus Y  | test Z for addition              | 0 | 0 | 14   | -14   | 0    | 0        | 1    | 0        | 0    | 1    | 1    | 0       | X plus Y  | test Z for addition              |   |
| 0 | 0  | 14    | -15  | -1   | 1        | 0    | 0        | 0    | 0    | 0    | X plus Y  | test N for addition              | 0 | 0 | 14   | -15   | -1   | 1        | 0    | 0        | 0    | 0    | 0    | 1       | X plus Y  | test N for addition              |   |
| 0 | 0  | 14    | 127  | -115 | 1        | 0    | 1        | 0    | 0    | 0    | X plus Y  | test V upwards for addition      | 0 | 0 | 14   | 127   | -115 | 1        | 0    | 1        | 0    | 0    | 0    | 0       | X plus Y  | test V upwards for addition      |   |
| 0 | 0  | -14   | -127 | 115  | 0        | 1    | 1        | 0    | 1    | 0    | X plus Y  | test V downwards for addition    | 0 | 0 | -14  | -127  | 115  | 0        | 1    | 1        | 0    | 1    | 0    | 0       | X plus Y  | test V downwards for addition    |   |
| 0 | 1  | 14    | 14   | 0    | 0        | 1    | 0        | 1    |      |      | X minus Y | test Z for subtraction           | 0 | 1 | 14   | 14    | 0    | 0        | 1    | 0        | 1    |      |      |         | X minus Y | test Z for subtraction           |   |
| 0 | 1  | 14    | 15   | -1   | 1        | 0    | 0        | 0    |      |      | X minus Y | test N for subtraction           | 0 | 1 | 14   | 15    | -1   | 1        | 0    | 0        | 0    |      |      |         | X minus Y | test N for subtraction           |   |
| 0 | 1  | 14    | -127 | -115 | 1        | 0    | 1        | 0    |      |      | X minus Y | test V upwards for subtraction   | 0 | 1 | 14   | -127  | -115 | 1        | 0    | 1        | 0    |      |      |         | X minus Y | test V upwards for subtraction   |   |
| 0 | 1  | -14   | 127  | 115  | 0        | 1    | 1        | 0    |      |      | X minus Y | test V downwards for subtraction | 0 | 1 | -14  | 127   | 115  | 0        | 1    | 1        | 0    |      |      |         | X minus Y | test V downwards for subtraction |   |
| 0 | 2  | 127   | 127  | -128 | 1        | 0    | 1        | 0    | 0    | 0    | X plus 1  | test V upwards for increment     | 0 | 2 | 127  | 127   | -128 | 1        | 0    | 1        | 0    | 0    | 0    | 0       | X plus 1  | test V upwards for increment     |   |
| 0 | 3  | -128  | 127  | 127  | 0        | 1    | 1        | 0    |      |      | X minus 1 | test V downwards for decrement   | 0 | 3 | -128 | 127   | 127  | 0        | 1    | 1        | 0    |      |      |         | X minus 1 | test V downwards for decrement   |   |
| 0 | 4  | 127   | 127  | -2   | 1        | 0    | 1        | 0    | 0    | 0    | X plus X  | test V upwards for doubling      | 0 | 4 | 127  | 127   | -2   | 1        | 0    | 1        | 0    | 0    | 0    | 0       | X plus X  | test V upwards for doubling      |   |
| 0 | 4  | -128  | 127  | 0    | 0        | 1    | 1        | 1    | 1    | 0    | X plus X  | test V downwards for doubling    | 0 | 4 | -128 | 127   | 0    | 0        | 1    | 1        | 1    | 1    | 1    | 0       | X plus X  | test V downwards for doubling    |   |
| 0 | 5  | -128  | 127  | -1   | 1        | 1    |          |      |      |      | minus 1   | test N C for -1                  | 0 | 5 | -128 | 127   | -1   | 1        | 1    |          |      |      |      |         | minus 1   | test N C for -1                  |   |
| 0 | 6  | -128  | 127  | 0    |          |      |          |      |      |      | N/A       | test invalid operation           | 0 | 6 | -128 | 127   | 0    |          |      |          |      |      |      |         | N/A       | test invalid operation           |   |
| 0 | 7  | -128  | 127  | 0    |          |      |          |      |      |      | N/A       | test invalid operation           | 0 | 7 | -128 | 127   | 0    |          |      |          |      |      |      |         | N/A       | test invalid operation           |   |
| 9 | 64 | -1104 | 1483 | -182 | 9        | 7    | 8        | 3    | 3    | 1    | 0         |                                  | 0 | 9 | 64   | -1104 | 1483 | -182     | 9    | 7        | 8    | 3    | 3    | 1       | 0         |                                  | 0 |



| M | F  | X     | Y    | S    | Negative | Cout | Overflow | Zero | Gout | Pout | Comment   | Purpose                          | M | F | X    | Y     | S    | Negative | Cout | Overflow | Zero | Gout | Pout | Comment | Purpose   |                                  |   |
|---|----|-------|------|------|----------|------|----------|------|------|------|-----------|----------------------------------|---|---|------|-------|------|----------|------|----------|------|------|------|---------|-----------|----------------------------------|---|
| 1 | 1  | -86   | 85   | -1   |          |      |          |      |      |      | X nand Y  | test nand                        | 1 | 1 | -86  | 85    | -1   |          |      |          |      |      |      |         | X nand Y  | test nand                        |   |
| 1 | 0  | -86   | 85   | 0    |          |      |          |      |      |      | X and Y   | test and                         | 1 | 0 | -86  | 85    | 0    |          |      |          |      |      |      |         | X and Y   | test and                         |   |
| 1 | 1  | -86   | 85   | -1   |          |      |          |      |      |      | X nand Y  | test nand                        | 1 | 1 | -86  | 85    | -1   |          |      |          |      |      |      |         | X nand Y  | test nand                        |   |
| 1 | 2  | -86   | 85   | -1   |          |      |          |      |      |      | X or Y    | test or                          | 1 | 2 | -86  | 85    | -1   |          |      |          |      |      |      |         | X or Y    | test or                          |   |
| 1 | 3  | -86   | 85   | 0    |          |      |          |      |      |      | X nor Y   | test nor                         | 1 | 3 | -86  | 85    | 0    |          |      |          |      |      |      |         | X nor Y   | test nor                         |   |
| 1 | 4  | -86   | 85   | -1   |          |      |          |      |      |      | X xor Y   | test xor                         | 1 | 4 | -86  | 85    | -1   |          |      |          |      |      |      |         | X xor Y   | test xor                         |   |
| 1 | 5  | -86   | 85   | 0    |          |      |          |      |      |      | X xnor Y  | test xnor                        | 1 | 5 | -86  | 85    | 0    |          |      |          |      |      |      |         | X xnor Y  | test xnor                        |   |
| 1 | 6  | -86   | 85   | -86  | 1        |      |          | 0    |      |      | X         | test X                           | 1 | 6 | -86  | 85    | -86  | 1        |      |          | 0    |      |      |         | X         | test X                           |   |
| 1 | 7  | -86   | -86  | -86  | 0        |      |          | 0    |      |      | Y         | test Y                           | 1 | 7 | -86  | -86   | -86  | 1        |      |          | 0    |      |      |         | Y         | test Y                           |   |
| 0 | 0  | 14    | -14  | 0    | 0        | 1    | 0        | 1    | 1    | 0    | X plus Y  | test Z for addition              | 0 | 0 | 14   | -14   | 0    | 0        | 1    | 0        | 0    | 1    | 1    | 0       | X plus Y  | test Z for addition              |   |
| 0 | 0  | 14    | -15  | -1   | 1        | 0    | 0        | 0    | 0    | 0    | X plus Y  | test N for addition              | 0 | 0 | 14   | -15   | -1   | 1        | 0    | 0        | 0    | 0    | 0    | 1       | X plus Y  | test N for addition              |   |
| 0 | 0  | 14    | 127  | -115 | 1        | 0    | 1        | 0    | 0    | 0    | X plus Y  | test V upwards for addition      | 0 | 0 | 14   | 127   | -115 | 1        | 0    | 1        | 0    | 0    | 0    | 0       | X plus Y  | test V upwards for addition      |   |
| 0 | 0  | -14   | -127 | 115  | 0        | 1    | 1        | 0    | 1    | 0    | X plus Y  | test V downwards for addition    | 0 | 0 | -14  | -127  | 115  | 0        | 1    | 1        | 0    | 1    | 0    | 0       | X plus Y  | test V downwards for addition    |   |
| 0 | 1  | 14    | 14   | 0    | 0        | 1    | 0        | 1    |      |      | X minus Y | test Z for subtraction           | 0 | 1 | 14   | 14    | 0    | 0        | 1    | 0        | 1    |      |      |         | X minus Y | test Z for subtraction           |   |
| 0 | 1  | 14    | 15   | -1   | 1        | 0    | 0        | 0    |      |      | X minus Y | test N for subtraction           | 0 | 1 | 14   | 15    | -1   | 1        | 0    | 0        | 0    |      |      |         | X minus Y | test N for subtraction           |   |
| 0 | 1  | 14    | -127 | -115 | 1        | 0    | 1        | 0    |      |      | X minus Y | test V upwards for subtraction   | 0 | 1 | 14   | -127  | -115 | 1        | 0    | 1        | 0    |      |      |         | X minus Y | test V upwards for subtraction   |   |
| 0 | 1  | -14   | 127  | 115  | 0        | 1    | 1        | 0    |      |      | X minus Y | test V downwards for subtraction | 0 | 1 | -14  | 127   | 115  | 0        | 1    | 1        | 0    |      |      |         | X minus Y | test V downwards for subtraction |   |
| 0 | 2  | 127   | 127  | -128 | 1        | 0    | 1        | 0    | 0    | 0    | X plus 1  | test V upwards for increment     | 0 | 2 | 127  | 127   | -128 | 1        | 0    | 1        | 0    | 0    | 0    | 0       | X plus 1  | test V upwards for increment     |   |
| 0 | 3  | -128  | 127  | 127  | 0        | 1    | 1        | 0    |      |      | X minus 1 | test V downwards for decrement   | 0 | 3 | -128 | 127   | 127  | 0        | 1    | 1        | 0    |      |      |         | X minus 1 | test V downwards for decrement   |   |
| 0 | 4  | 127   | 127  | -2   | 1        | 0    | 1        | 0    | 0    | 0    | X plus X  | test V upwards for doubling      | 0 | 4 | 127  | 127   | -2   | 1        | 0    | 1        | 0    | 0    | 0    | 0       | X plus X  | test V upwards for doubling      |   |
| 0 | 4  | -128  | 127  | 0    | 0        | 1    | 1        | 1    | 1    | 0    | X plus X  | test V downwards for doubling    | 0 | 4 | -128 | 127   | 0    | 0        | 1    | 1        | 1    | 1    | 1    | 0       | X plus X  | test V downwards for doubling    |   |
| 0 | 5  | -128  | 127  | -1   | 0        | 1    |          |      |      |      | minus 1   | test N C for -1                  | 0 | 5 | -128 | 127   | -1   | 1        | 1    |          |      |      |      |         | minus 1   | test N C for -1                  |   |
| 0 | 6  | -128  | 127  | 0    |          |      |          |      |      |      | N/A       | test invalid operation           | 0 | 6 | -128 | 127   | 0    |          |      |          |      |      |      |         | N/A       | test invalid operation           |   |
| 0 | 7  | -128  | 127  | 0    |          |      |          |      |      |      | N/A       | test invalid operation           | 0 | 7 | -128 | 127   | 0    |          |      |          |      |      |      |         | N/A       | test invalid operation           |   |
| 9 | 64 | -1104 | 1483 | -182 | 7        | 7    | 8        | 3    | 3    | 1    | 0         |                                  | 0 | 9 | 64   | -1104 | 1483 | -182     | 9    | 7        | 8    | 3    | 3    | 1       | 0         |                                  | 0 |

| M | F  | X     | Y    | S    | Negative | Cout | Overflow | Zero | Gout | Pout | Comment   | Purpose                          | M | F | X    | Y     | S    | Negative | Cout | Overflow | Zero | Gout | Pout | Comment   | Purpose                          |                               |   |
|---|----|-------|------|------|----------|------|----------|------|------|------|-----------|----------------------------------|---|---|------|-------|------|----------|------|----------|------|------|------|-----------|----------------------------------|-------------------------------|---|
| 1 | 1  | -86   | 85   | -1   |          |      |          |      |      |      | X nand Y  | test nand                        | 1 | 1 | -86  | 85    | -1   |          |      |          |      |      |      | X nand Y  | test nand                        |                               |   |
| 1 | 0  | -86   | 85   | 0    |          |      |          |      |      |      | X and Y   | test and                         | 1 | 0 | -86  | 85    | 0    |          |      |          |      |      |      | X and Y   | test and                         |                               |   |
| 1 | 1  | -86   | 85   | -1   |          |      |          |      |      |      | X nand Y  | test nand                        | 1 | 1 | -86  | 85    | -1   |          |      |          |      |      |      | X nand Y  | test nand                        |                               |   |
| 1 | 2  | -86   | 85   | -1   |          |      |          |      |      |      | X or Y    | test or                          | 1 | 2 | -86  | 85    | -1   |          |      |          |      |      |      | X or Y    | test or                          |                               |   |
| 1 | 3  | -86   | 85   | 0    |          |      |          |      |      |      | X nor Y   | test nor                         | 1 | 3 | -86  | 85    | 0    |          |      |          |      |      |      | X nor Y   | test nor                         |                               |   |
| 1 | 4  | -86   | 85   | -1   |          |      |          |      |      |      | X xor Y   | test xor                         | 1 | 4 | -86  | 85    | -1   |          |      |          |      |      |      | X xor Y   | test xor                         |                               |   |
| 1 | 5  | -86   | 85   | 0    |          |      |          |      |      |      | X xnor Y  | test xnor                        | 1 | 5 | -86  | 85    | 0    |          |      |          |      |      |      | X xnor Y  | test xnor                        |                               |   |
| 1 | 6  | -86   | 85   | -86  | 1        |      |          | 0    |      |      | X         | test X                           | 1 | 6 | -86  | 85    | -86  | 1        |      |          | 0    |      |      | X         | test X                           |                               |   |
| 1 | 7  | -86   | -86  | -86  | 1        |      |          | 0    |      |      | Y         | test Y                           | 1 | 7 | -86  | -86   | -86  | 1        |      |          | 0    |      |      | Y         | test Y                           |                               |   |
| 0 | 0  | 14    | -14  | 0    | 0        | 1    | 0        | 1    | 1    | 0    | X plus Y  | test Z for addition              | 0 | 0 | 14   | -14   | 0    | 0        | 1    | 0        | 0    | 1    | 1    | 0         | X plus Y                         | test Z for addition           |   |
| 0 | 0  | 14    | -15  | -1   | 1        | 0    | 0        | 0    | 0    | 0    | X plus Y  | test N for addition              | 0 | 0 | 14   | -15   | -1   | 1        | 0    | 0        | 0    | 0    | 0    | 1         | X plus Y                         | test N for addition           |   |
| 0 | 0  | 14    | 127  | -115 | 1        | 0    | 1        | 0    | 0    | 0    | X plus Y  | test V upwards for addition      | 0 | 0 | 14   | 127   | -115 | 1        | 0    | 1        | 0    | 0    | 0    | 0         | X plus Y                         | test V upwards for addition   |   |
| 0 | 0  | -14   | -127 | 115  | 0        | 1    | 1        | 0    | 1    | 0    | X plus Y  | test V downwards for addition    | 0 | 0 | -14  | -127  | 115  | 0        | 1    | 1        | 0    | 1    | 0    | 0         | X plus Y                         | test V downwards for addition |   |
| 0 | 1  | 14    | 14   | 0    | 0        | 1    | 0        | 1    |      |      | X minus Y | test Z for subtraction           | 0 | 1 | 14   | 14    | 0    | 0        | 1    | 0        | 1    |      |      | X minus Y | test Z for subtraction           |                               |   |
| 0 | 1  | 14    | 15   | -1   | 1        | 0    | 0        | 0    |      |      | X minus Y | test N for subtraction           | 0 | 1 | 14   | 15    | -1   | 1        | 0    | 0        | 0    |      |      | X minus Y | test N for subtraction           |                               |   |
| 0 | 1  | 14    | -127 | -115 | 1        | 0    | 1        | 0    |      |      | X minus Y | test V upwards for subtraction   | 0 | 1 | 14   | -127  | -115 | 1        | 0    | 1        | 0    |      |      | X minus Y | test V upwards for subtraction   |                               |   |
| 0 | 1  | -14   | 127  | 115  | 0        | 1    | 1        | 0    |      |      | X minus Y | test V downwards for subtraction | 0 | 1 | -14  | 127   | 115  | 0        | 1    | 1        | 0    |      |      | X minus Y | test V downwards for subtraction |                               |   |
| 0 | 2  | 127   | 127  | -128 | 1        | 0    | 1        | 0    | 0    | 0    | X plus 1  | test V upwards for increment     | 0 | 2 | 127  | 127   | -128 | 1        | 0    | 1        | 0    | 0    | 0    | X plus 1  | test V upwards for increment     |                               |   |
| 0 | 3  | -128  | 127  | 127  | 0        | 1    | 1        | 0    |      |      | X minus 1 | test V downwards for decrement   | 0 | 3 | -128 | 127   | 127  | 0        | 1    | 1        | 0    |      |      | X minus 1 | test V downwards for decrement   |                               |   |
| 0 | 4  | 127   | 127  | -2   | 1        | 0    | 1        | 0    | 0    | 0    | X plus X  | test V upwards for doubling      | 0 | 4 | 127  | 127   | -2   | 1        | 0    | 1        | 0    | 0    | 0    | X plus X  | test V upwards for doubling      |                               |   |
| 0 | 4  | -128  | 127  | 0    | 0        | 1    | 1        | 1    | 1    | 0    | X plus X  | test V downwards for doubling    | 0 | 4 | -128 | 127   | 0    | 0        | 1    | 1        | 1    | 1    | 0    | X plus X  | test V downwards for doubling    |                               |   |
| 0 | 5  | -128  | 127  | -1   | 1        | 1    |          |      |      |      | minus 1   | test N C for -1                  | 0 | 5 | -128 | 127   | -1   | 1        | 1    |          |      |      |      | minus 1   | test N C for -1                  |                               |   |
| 0 | 6  | -128  | 127  | 0    |          |      |          |      |      |      | N/A       | test invalid operation           | 0 | 6 | -128 | 127   | 0    |          |      |          |      |      |      | N/A       | test invalid operation           |                               |   |
| 0 | 7  | -128  | 127  | 0    |          |      |          |      |      |      | N/A       | test invalid operation           | 0 | 7 | -128 | 127   | 0    |          |      |          |      |      |      | N/A       | test invalid operation           |                               |   |
| 9 | 64 | -1104 | 1483 | -182 | 9        | 7    | 8        | 3    | 3    | 1    | 0         |                                  | 0 | 9 | 64   | -1104 | 1483 | -182     | 9    | 7        | 8    | 3    | 3    | 1         | 0                                |                               | 0 |

IDEAL

[illegible]