

Problem 2. (12 points):

In the following questions assume the variables `a` and `b` are signed integers and that the machine uses two's complement representation. Also assume that `MAX_INT` is the maximum integer, `MIN_INT` is the minimum integer, and `W` is one less than the word length (e.g., `W = 31` for 32-bit integers).

Match each of the descriptions on the left with a line of code on the right (write in the letter). You will be given 2 points for each correct match.

1. One's complement of `a`

2. `a`.

3. `a & b`.

4. `a * 7`.

5. `a / 4`.

6. `(a < 0) ? 1 : -1`.

a. `~(~a | (b ^ (MIN_INT + MAX_INT)))`

b. `((a ^ b) & ~b) | ~(a ^ b) & b`

c. `1 + (a << 3) + ~a`

d. `(a << 4) + (a << 2) + (a << 1)`

e. `((a < 0) ? (a + 3) : a) >> 2`

f. `a ^ (MIN_INT + MAX_INT)`

g. `~((a | (~a + 1)) >> W) & 1`

h. `~((a >> W) << 1)`

i. `a >> 2`