Date

* Program 2 - Solve Following shifting operation on paper and share that with your leader.

① num = 75 result = num >> 2

| | $2^{31}$ | 128 ($2^7$) | 64 ($2^6$) | 32 ($2^5$) | 16 ($2^4$) | 8 ($2^3$) | 4 ($2^2$) | 2 ($2^1$) | 1 ($2^0$) |
|---|---|---|---|---|---|---|---|---|---|
| | 0 ---------- | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 75 → | 0 ---------- | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 1 |

75 | 11 | 3 | 1
-64 | -8 | -2 | -1
11 | 3 | 1 | 0

75 → 0 ---------- 0 1 0 0 1 0 1 1
discard

>>2 → 0 0 ---------- 0 0 0 1 0 0 1 0
$2^4$ $2^3$ $2^2$ $2^1$ $2^0$

16 + 2 = 18 (Ans)

It is a right shift bitwise operator.
shift the (75) by 2 bits to the right.
In this we have to consider that whether the no is positive or negative.
IF the given no is positive, then after shifting the bits. filled the blank places with 0 otherwise filled with 1.

② num = -38 result = num >> 4

| | $2^{31}$ | 128 ($2^7$) | 64 ($2^6$) | 32 ($2^5$) | 16 ($2^4$) | 8 ($2^3$) | 4 ($2^2$) | 2 ($2^1$) | 1 ($2^0$) |
|---|---|---|---|---|---|---|---|---|---|
| | 0 ---------- | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 38 → | 0 ---------- | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 |

38 | 6 | 2
-32 | -4 | -2
6 | 2 | 0

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$2^{31}$ ... $2^6$ $2^5$ $2^4$ $2^3$ $2^2$ $2^1$ $2^0$

38 → 0 - - - - - - - - - - 0 0 0 0 0 0 1 0 0 1 1 0

1's comple → 1 - - - - - - - - - - 1 1 1 1 1 1 0 1 1 0 0 1

\+ 0 - - - - - - - - - - 0 0 0 0 0 0 0 0 0 0 0 1

(-38) → 1 - - - - - - - - - - 1 1 1 1 1 1 0 1 1 0 1 0

discard

$2^{31}$

>>4 → 1 - - - - - - - - - - 1 1 1 1 1 1 1 1 1 1 0 1

↑ (-3) Ans

$2^{31}$ ... $2^{11}$ $2^{10}$ $2^9$ $2^8$ $2^7$ $2^6$ $2^5$ $2^4$ $2^3$ $2^2$ $2^1$ $2^0$

38 → 0 - - - - - - - - - - 0 0 0 0 0 0 1 0 0 1 1 0

discard

>>4 → 0 - - - - - - - - - - 0 0 0 0 0 0 0 0 0 0 0 1 0

Trick

2+1 = (-3)

$2^{31}$ ... $2^5$ $2^4$ $2^3$ $2^2$ $2^1$ $2^0$

3 → 0 - - - - - - - - - - 0 0 0 0 0 0 0 0 0 0 1 1

1's compl → 1 - - - - - - - - - - 1 1 1 1 1 1 1 1 1 1 0 0

\+ 0 - - - - - - - - - - 0 0 0 0 0 0 0 0 0 0 0 1

(-3) → 1 - - - - - - - - - - 1 1 1 1 1 1 1 1 1 1 0 1

Here the no is negative i.e. (-38)
Hence after shifting (-38) by 4 bits to the right, we filled the blank places with 1.