

Integers – Lesson 1

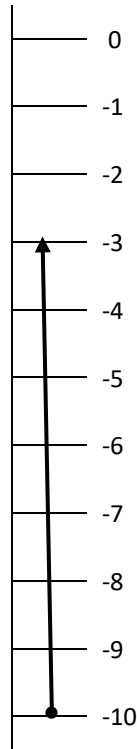
Today we will start work on integers: positive and negative whole numbers. We have done some work on this topic already in January and February so we will start with a little revision before we introduce any new work.

What is $-10 + 7$?

The correct answer to this question is -3

Imagine a vertical number line

- start at -10
- move up 7
- arrive at -3 .

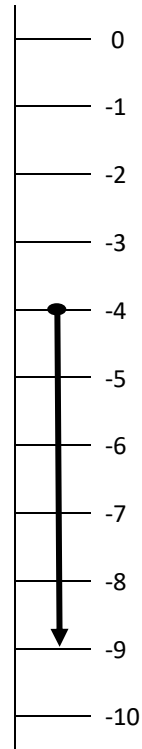


What is $-4 - 5$?

The correct answer to the question above is -9 .

Imagine a vertical number line:-

- start at -4
- move down 5
- arrive at -9 .



Now try these examples: -

- | | | | | |
|--------------|--------------|---------------|---------------|----------------|
| 1) $-10 + 2$ | 2) $-10 - 8$ | 3) $-10 + 20$ | 4) $-10 + 21$ | 5) $-22 + 10$ |
| 6) $2 - 10$ | 7) $8 - 10$ | 8) $0 - 10$ | 9) $-100 - 2$ | 10) $-100 + 2$ |

Copy and complete these calculations. For example: -

$$-8 + 3 = -5 \quad 2 - 8 = -6 \quad -2 + 10 = 8$$

- | | | | | |
|----------------------------------|-----------------------------------|---------------------------------|-----------------------------------|-----------------------------------|
| 11) $-10 \underline{\quad} = -5$ | 12) $-10 \underline{\quad} = -15$ | 13) $-10 \underline{\quad} = 0$ | 14) $-10 \underline{\quad} = 10$ | 15) $-10 \underline{\quad} = -20$ |
| 16) $2 \underline{\quad} = -10$ | 17) $-2 \underline{\quad} = 0$ | 18) $-2 \underline{\quad} = 10$ | 19) $-20 \underline{\quad} = -10$ | 20) $-20 \underline{\quad} = 10$ |

Previously we have looked at simplifying expressions, for example: -

$$4x + 6x = 10x$$

$$y + y + y + y = 4y$$

$$7m - 2m = 5m$$

Now we can include example which have negative numbers, for example: -

$$-10g + 4g = -6g$$

$$-5f - 6f = -11f$$

$$2k - 9k = -7k$$

$$m - 7m = -6m$$

$$-7p + 7p = 0$$

Now try these examples: -

21) $-4a + 2a$

22) $-4a - 2a$

23) $-4a + 4a$

24) $-4a + 8a$

25) $4a - 10a$

26) $-6b - 3b$

27) $-6b + 3b$

28) $-6b + 10b$

29) $-6b + 6b$

30) $6b - 12b$

In the past we have also simplified expressions with more than letter in them, for example: -

$$2a + 3b + 2a + 4b = 4a + 7b$$

$$6c + 7d - 4c - 6d = 2c + d$$

$$4e + 5f - 4e + 5f = 10f$$

$$3g + 4h - 3g - 4h = 0$$

Now we can cope with examples that have more than one letter and negative terms, for example

$$2a + 3b - 6a - 7b = -4a - 4b \leftarrow 2a - 6a = \underline{-4a} \text{ (write it down) then } 3b - 7b = \underline{-4b} \text{ (write it down)}$$

$$-5c - 6d - 3c + 3d = -8c - 3d \leftarrow -5c - 3c = \underline{-8c} \text{ (write it down) then } -6d + 3d = \underline{-3d} \text{ (write it down)}$$

$$4e + 5f - 6e - 5f = -2e \leftarrow 4e - 6e = \underline{-2e} \text{ (write it down) } 5f - 5f = 0 \text{ (no need to write any more)}$$

$$-7a + b + 4b - 2a + 3b = -9b + 7 \leftarrow -7a - 2a = \underline{-9a} \text{ (write it down) } 4b + 3b = 7b \text{ (write down } \underline{+7b})$$

Now try these examples: -

31) $2a + 3b + 4a - 5b$

32) $c + d - 5c - 5d$

33) $3e + 4f - 5e - 6f$

34) $-2g - 3f - 4g - 5f$

35) $-2g - 3f + 4g + 5f$

36) $-2g - 3f + 4g - 5f$

37) $2j - 3k - 4j - 5k$

38) $2j - 3k + 4j + 5k$

39) $2j - 3k - 4j + 5k$

40) $4m + 5n - 6m - 7n + 8m - 9n$