

Consider $+3 - 8 + 1 + 4 - 2 + 7 - 3 - 6 + 5 = +1$

We can work our way along the line one term at a time to arrive at an answer of $+1$

However, we can also work out the answer by collecting the positives and negatives separately

$$\begin{aligned}
 &+3 + 1 + 4 + 7 + 5 \quad - 8 - 2 - 3 - 6 \\
 = &+20 \quad - 19 \\
 = &+1
 \end{aligned}$$

Points to note:

1. Collecting together positives means adding to get more positives
2. Collecting together negatives means adding to get more negatives
3. Finally, collecting positives with negatives means subtracting with the sign of the answer being determined by what we have the most of.

Examples

$$+3 + 5 = +8$$

$$-5 - 2 = -7$$

$$+4 - 1 = +3$$

$$+5 - 9 = -4$$

$$-7 + 3 = -4$$

$$-2 + 8 = +6$$

$$-3 + 3 = 0$$

If you find this difficult, there are two routines that you might find helpful

The Thermometer

Consider the first number as a temperature and let the second number tell you which way and how far to move on the temperature scale.

Example $+5 - 9$

Start at temperature $+5$ and move down 9.

Moving down 5 gets you to 0 and then moving down another 4 gets you to -4

$$\underline{\underline{\text{so } +5 - 9 = -4}}$$

The Football Match

Suppose the pluses are playing the minuses at football. Who wins and by how many?

Example 1 $+5 - 9$

The minuses win by 4 so answer -4

Example 2 $-3 - 4$

The minuses score all the goals and so they win by 7 Answer is -7

Example 3 $+5 + 6$

Pluses win by 11 so answer is $+11$

Example 4 $-1 + 7$

Pluses win by 6 so answer is $+6$

Example 5 $-8 + 3$

Minuses win by 5 so answer is $+5$

Now complete the associated exercise on signed numbers.

Collecting like terms

Ex1

$$5x + 2y + 3x + 4y = 8x + 6y$$

Ex2

$$7x - 3y + x + 7y = 8x + 4y$$

Ex3

$$5p + 3q - 2p - 9q + 7 = 3p - 6q + 7$$

Here we can collect terms in p , terms in q , and ordinary numbers

Ex4

$$6x^2 + 2xy + x^2 - 5yx = 7x^2 - 3xy$$

Ex5

$$5hk - 3pq + 2pq - hk = 4hk - pq$$

Ex6

$$5x^2 + y^2 - 5x^2 + y^2 = 2y^2$$

Ex7

$$7p - 2q + 3r + p - 2q + 5r = 8p - 4q + 8r$$

Ex8

$$5x - 3 - 7x - 4 = -2x - 7$$

Ex9

$$pqr - 2qrp + 5rqp = 4pqr$$

Now complete the exercise on collecting like terms