

Lesson 8 – Adding Negative Numbers

Starter

Work out:

1) $\frac{1}{3} + \frac{1}{5}$

2) $\frac{3}{4} - \frac{2}{3}$

3) $2\frac{1}{3} + 1\frac{1}{2}$

4) $5\frac{1}{8} - 2\frac{2}{3}$

Starter Answers

1) $\frac{8}{15}$

2) $\frac{1}{12}$

3) $\frac{23}{6}$

4) $\frac{59}{24}$

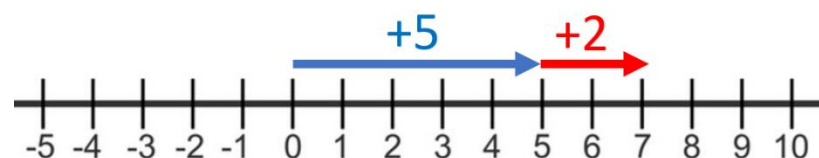
We can think of the number 5 as a **distance of 5** from zero in the **positive** direction.



This arrow is called a **vector** because it has a **size** (length) and a **direction** (positive or negative).

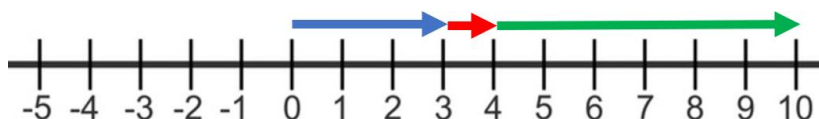
We can use vectors to show calculations like $5 + 2$.

$5 + 2$ means we travel a distance of 5 from zero in the positive direction, then a further distance of 2 in the positive direction.



Example 1

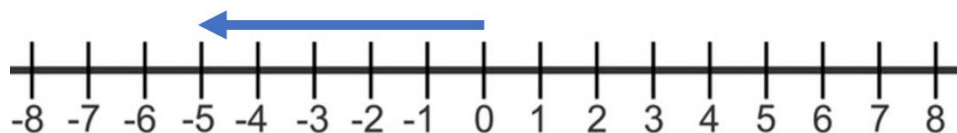
What calculation are these vectors showing?



This is showing the calculation $3 + 1 + 6 = 10$

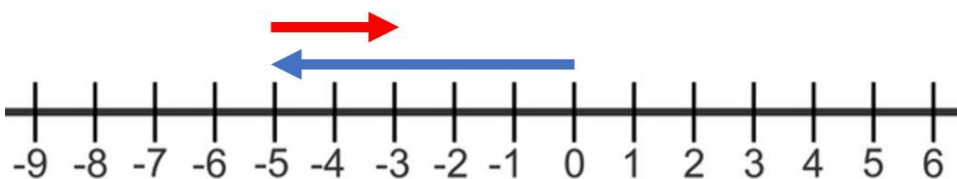
We can also show **negative numbers** using vectors.

The number -5 is a distance of 5 from zero in the **negative** direction.



We can use vectors to show a calculation like $-5 + 2$.

This would mean you travel a **distance of 5** in the **negative** direction and a **distance of 2** in the **positive** direction.



We can see that we end up at -3. So, $-5 + 2 = -3$

Example 2

What calculation are these vectors showing?

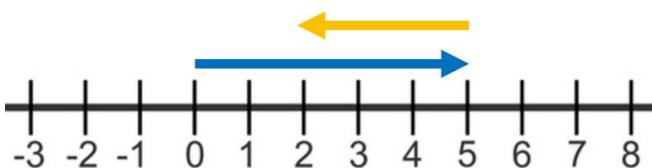


We are moving a distance of 3 from zero in the positive direction and then a distance of 6 in the negative direction. We end up at -3. This is $3 + -6 = -3$

We can also think of this as $3 - 6 = -3$

Example 3

What calculation are these vectors showing?



We are moving a distance of 5 in the positive direction, then a distance of 3 in the negative direction. So we are doing $+5$ and -3 . This is $5 + -3 = 2$

We can also think of this as $5 - 3 = 2$.

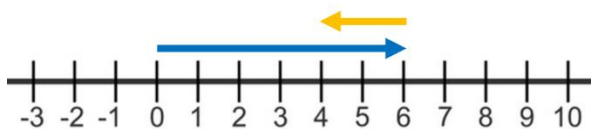
We can see that when we **add a negative**, we are actually **counting backwards** in the negative direction.

So when we add a negative, we are actually **subtracting**.

Example 4

Using vectors, draw each calculation and then write down the answer.

1) $6 + -2$



Move 6 in the positive direction, then 2 in the negative direction.

We end up at 4.

$$6 + -2 = 4$$

2) $3 + -5$



Move 3 in the positive direction, then 5 in the negative direction.

We end up at -2.

$$3 + -5 = -2$$

3) $-4 + 7$



Move 4 in the negative direction, then 7 in the positive direction.

We end up at 3.

$$-4 + 7 = 3$$

4) $-3 + -5$



Move 3 in the negative direction, then 5 in the negative direction.

We end up at -8.

$$-3 + -5 = -8$$

Your go

1) $-4 + 8$

2) $6 + -2$

3) $-2 + 8$

4) $4 + -5$

5) $10 + -7$

6) $4 + -8$

7) $-3 + -2$

8) $-5 + 6$

9) $3 + -1$

10) $-5 + -11$

Answers

1) 4

2) 4

3) 6

4) -1

5) 3

6) -4

7) -5

8) 1

9) 2

10) -16