

Vector Geometry

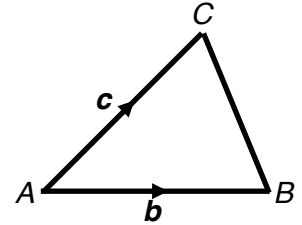
Starter

1. (Review of last lesson) Given that $A(-4, 9)$ and $B(8, -5)$, find the vector \overrightarrow{AB} .

Notes

In the diagram ABC is a triangle where $\overrightarrow{AB} = \mathbf{b}$ and $\overrightarrow{AC} = \mathbf{c}$.

To find \overrightarrow{BC} we cannot go directly from B to C because there is no vector written on \overrightarrow{BC} . Therefore, we must use a different route.



We can get from B to C by first going from B to A and then from A to C

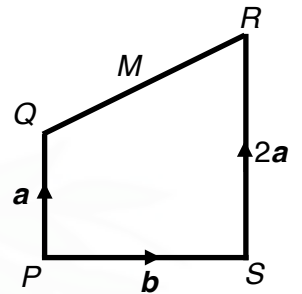
So
$$\overrightarrow{BC} = \overrightarrow{BA} + \overrightarrow{AC}$$

$$\overrightarrow{BC} = -\mathbf{b} + \mathbf{c}$$
notice the domino effect in the middle i.e. the letters are both A
notice that it is $-\mathbf{b}$ because we are going from \overrightarrow{BA} not \overrightarrow{AB}

- E.g. 1** In the trapezium, $PQRS$: $\overrightarrow{PQ} = \mathbf{a}$, $\overrightarrow{PS} = \mathbf{b}$ and $2\overrightarrow{PQ} = \overrightarrow{SR}$.
Let M be the mid-point of QR .

Find, in terms of \mathbf{a} and \mathbf{b} :

- (a) \overrightarrow{QS} (b) \overrightarrow{SQ} (c) \overrightarrow{PR} (d) \overrightarrow{QR} (e) \overrightarrow{QM}



- Working** (a) We cannot go directly to \overrightarrow{QS} as no vector connect Q and S . Instead we must go via P .

$$\overrightarrow{QS} = \overrightarrow{QP} + \overrightarrow{PS} = -\mathbf{a} + \mathbf{b}$$

N.B. We cannot go via R because we aren't given the vector \overrightarrow{QR} .

Video: [Vectors](#)

[Solutions to Starter and E.g.s](#)

Exercise

- 9-1 class textbook: p336 M10.13 Qu 6-12; p340 E10.1 Qu 1-11
 A*-G class textbook: p300 E10.2 Qu 6-10; p304 E10.3 Qu 1-11
 9-1 homework book: p118 M10.13 Qu 3, 4, 6; p119 E10.1 Qu 1-4
 A*-G homework book: p86 E10.2 Qu 3, 4, 6; p87 E10.3 Qu 1-4

Summary

To get from one point to another choose a route around the diagram E.g. $\overrightarrow{BC} = \overrightarrow{BA} + \overrightarrow{AC}$
 Make sure of the domino effect in the middle i.e. the letters are both A .

[Homework book answers \(only available during a lockdown\)](#)