

# Year 10 Mathematics Learning Journey: Unit 8 - Vectors

Step 10 (H): Geometric arguments and proofs

The point M is  $\frac{1}{4}$  of the way along XY. If  $\overrightarrow{XY} = 8\mathbf{a} - 4\mathbf{b}$ , work out  $\overrightarrow{XM}$ ,  $\overrightarrow{MY}$  and  $\overrightarrow{MX}$  in terms of  $\mathbf{a}$  and  $\mathbf{b}$ .

Step 9 (H): Collinear points

$\overrightarrow{XY} : \overrightarrow{YZ} = 2:3$ .  
If  $\overrightarrow{XY} = 2\mathbf{a} + 4\mathbf{b}$ , show that  $\overrightarrow{YZ} = 3\mathbf{a} + 6\mathbf{b}$ .  
Prove that points X, Y and Z are collinear.

Step 8 (H): Understand parallel vectors

How do we know, without drawing them, whether column vectors are parallel to each other?

Step 5: Addition and subtraction of vectors

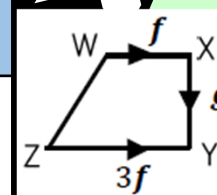
What is the relationship between  $\mathbf{b}$  and  $-\mathbf{b}$ ?

Step 6 (H): Vector journeys in shapes

How do we know whether  $\overrightarrow{BA}$  is  $\mathbf{a}$  or  $-\mathbf{a}$ ?

Step 7 (H): Quadrilaterals using vectors

What type of quadrilateral is this?  
Express  $\overrightarrow{WZ}$  in terms of  $\mathbf{f}$  and  $\mathbf{g}$ .



Step 4: Addition of vectors

How do we identify the resultant of two vectors?

Step 3: Vectors multiplied by a scalar?

What is the same and what is different about parallel vectors?

Step 2: Use and read vector notation

What is the significance of the order of the letters when writing  $\overrightarrow{AB}$ ? What does the arrow tell us?

Step 1: Understand and represent vectors

How do you know which direction the numbers in a column vector represent?

Achievement resilience

Community

PERSEVERANCE

**Pride**

**SHUTTLEWORTH**

COLLEGE