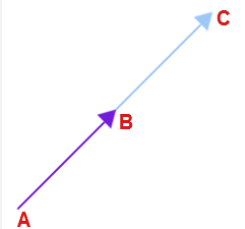
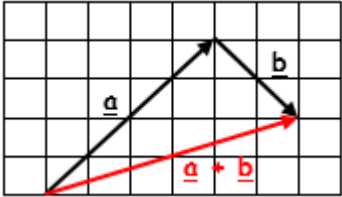


## KS3 Unit 54 Vectors

| Topic/Skill         | Definition/Tips   | Example  |
|---------------------|---|--|
| 1. Translation      | <b>Translate</b> means to <b>move a shape</b> .<br>The shape does not change <b>size</b> or <b>orientation</b> .  |  |
| 2. Vector Notation  | A vector can be written in 3 ways:<br>$\mathbf{a}$ or $\overrightarrow{AB}$ or $\begin{pmatrix} 1 \\ 3 \end{pmatrix}$                                   |  |
| 3. Column Vector    | In a column vector, the <b>top</b> number moves <b>left (-) or right (+)</b> and the <b>bottom</b> number moves <b>up (+) or down (-)</b>               | $\begin{pmatrix} 2 \\ 3 \end{pmatrix}$ means '2 right, 3 up'<br>$\begin{pmatrix} -1 \\ -5 \end{pmatrix}$ means '1 left, 5 down'  |
| 4. Vector           | A <b>vector</b> is a quantity represented by an arrow with both <b>direction</b> and <b>magnitude</b> .<br>$\overrightarrow{AB} = -\overrightarrow{BA}$ |  |
| 5. Magnitude        | Magnitude is defined as the <b>length</b> of a vector.  | <div style="border: 1px solid black; padding: 5px; width: fit-content;"> <p>Magnitude (length) can be calculated using Pythagoras Theorem:<br/> <math>3^2 + 4^2 = 25</math><br/> <math>\sqrt{25} = 5</math></p> </div> |
| 6. Equal Vectors    | If two vectors have the <b>same magnitude</b> and <b>direction</b> , they are <b>equal</b> .  |  |
| 7. Parallel Vectors | <b>Parallel</b> vectors are <b>multiples</b> of each other.   |  |

|                             |   |   |
|-----------------------------|---|---|
| <p>8. Collinear Vectors</p> | <p><b>Collinear</b> vectors are vectors that are on the <b>same line</b>.<br/>To show that two vectors are <b>collinear</b>, show that one vector is a <b>multiple</b> of the other (parallel) <b>AND</b> that both vectors <b>share a point</b>.</p> |    |
| <p>9. Resultant Vector</p>  | <p>The <b>resultant</b> vector is the vector that results from <b>adding</b> two or more vectors together.</p> <p>The resultant can also be shown by <b>lining up</b> the <b>head</b> of one vector with the <b>tail</b> of the other.</p>            | <p>if <math>\underline{a} = \begin{pmatrix} 4 \\ 4 \end{pmatrix}</math> and <math>\underline{b} = \begin{pmatrix} 2 \\ -2 \end{pmatrix}</math></p> <p>then <math>\underline{a} + \underline{b} = \begin{pmatrix} 4 \\ 4 \end{pmatrix} + \begin{pmatrix} 2 \\ -2 \end{pmatrix} = \begin{pmatrix} 6 \\ 2 \end{pmatrix}</math></p>  |