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| **Topic/Skill**  | **Definition/Tips** | **Example****Topic: Congruence and Similarity**  |
| 1. Congruent Shapes | Shapes are congruent if they are **identical** - **same shape** and **same size**.Shapes can be rotated or reflected but still be congruent. |  |
| 2. Congruent Triangles | 4 ways of proving that two triangles are congruent:1. **SSS** (Side, Side, Side)2. **RHS** (Right angle, Hypotenuse, Side)3. **SAS** (Side, Angle, Side)4. **ASA** (Angle, Side, Angle) or **AAS**ASS does not prove congruency. |  |
| 3. Similar Shapes | Shapes are similar if they are the **same shape but different sizes**.The proportion of the matching sides must be the same, meaning the ratios of corresponding sides are all equal. |  |
| 4. Scale Factor | The **ratio of corresponding sides** of two similar shapes.To find a scale factor, **divide a length** on one shape **by the corresponding length** on a similar shape. | Image result for math definition scale factorScale Factor = $15÷10=1.5$ |
| 5. Finding missing lengths in similar shapes | 1. Find the **scale factor**. 2. **Multiply or divide** the corresponding side to find a missing length.If you are finding a missing length on the larger shape you will need to multiply by the scale factor.If you are finding a missing length on the smaller shape you will need to divide by the scale factor. | Scale Factor = $3÷2=1.5$$x=4.5×1.5=6.75cm$  |
| 6. Similar Triangles | To show that two triangles are similar, show that:1. The three sides are in the same proportion2. Two sides are in the same proportion, and their included angle is the same3. The three angles are equal | image: two triangles: left triangle: top Y corner: 85 degrees, right Z corner: 40 degrees, left corner: X. Right triangle: same labels: Y: 85 degrees, X: 55 degrees.image: two triangles: left triangle: top Y corner: 85 degrees, right Z corner: 40 degrees, left corner: X. Right triangle: same labels: Y: 85 degrees, X: 55 degrees. |
| **Topic/Skill**  | **Definition/Tips****Topic: Vectors**  | **Example** |
| 1. Translation | **Translate** means to **move a shape**. The shape does not change **size** or **orientation**. | Image result for translation maths |
| 2. Vector Notation | A vector can be written in 3 ways:**a** or $\vec{AB}$ or $\left(\begin{matrix}1\\3\end{matrix}\right)$ |  |
| 3. Column Vector | In a column vector, the **top** number moves **left (-) or right (+)** and the **bottom** number moves **up (+) or down (-)** | $\left(\begin{matrix}2\\3\end{matrix}\right)$ means ‘2 right, 3 up’$\left(\begin{matrix}-1\\-5\end{matrix}\right)$ means ‘1 left, 5 down’ |
| 4. Vector | A **vector** is a quantity represented by an arrow with both **direction** and **magnitude**.$$\vec{AB}=-\vec{BA}$$ |  |
| 5. Magnitude | Magnitude is defined as the **length** of a vector. |  |
| 6. Equal Vectors | If two vectors have the **same magnitude and direction**, they are **equal**. | image: two parallel lines, both are diagonal with arrows marking the an upward direction |
| 7. Parallel Vectors | **Parallel** vectors are **multiples** of each other. | 2**a**+**b** and 4**a**+2**b** are parallel as they are multiple of each other.Image result for parallel vectors |
| 8. Resultant Vector | The **resultant** vector is the vector that results from **adding** two or more vectors together.The resultant can also be shown by **lining up** the **head** of one vector with the **tail** of the other. | if **a** = $\left(\genfrac{}{}{0pt}{}{4}{4}\right)$ and **b** = $\left(\genfrac{}{}{0pt}{}{2}{-2}\right)$then **a** + **b** = $\left(\genfrac{}{}{0pt}{}{4}{4}\right)$ + $\left(\genfrac{}{}{0pt}{}{2}{-2}\right)$ = $\left(\genfrac{}{}{0pt}{}{6}{2}\right)$ |
| 9. Scalar of a Vector | A **scalar** is the **number** we **multiply** a vector by. | Example:3a + 2b = = 3$\left(\genfrac{}{}{0pt}{}{2}{1}\right)$ + 2$\left(\genfrac{}{}{0pt}{}{4}{-1}\right)$ = $\left(\genfrac{}{}{0pt}{}{6}{3}\right)$ + $\left(\genfrac{}{}{0pt}{}{8}{-2}\right)$= $\left(\genfrac{}{}{0pt}{}{14}{1}\right)$ |

**Knowledge Organiser**