Pythagoras's Theorem

Pythagoras' theorem	a **relationship** between the **3 sides** on a **right angled triangle**
Pythagoras' theorem	$a^2 + b^2 = c^2$ **'c'** is always the **hypotenuse**
Pythagoras' theorem in 3D	$a^2 + b^2 + c^2 = h^2$

Labelling for Pythagoras theorem

$a^2 + b^2 = c^2$
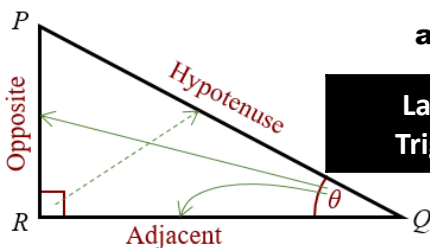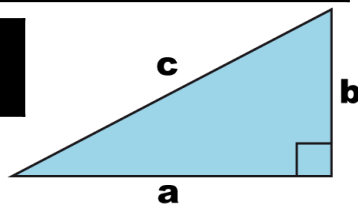
Labelling for Trigonometry

TRIGONOMETRIC RATIOS

trigonometric ratios	**sine (sin), cosine (cos) and tangent (tan)** use with **right angled triangles** ratios between **2 lengths and an angle**
hypotenuse	the **longest side** on a **right angled triangle** it is always **opposite the right angle**
opposite side	this side **depends** on the **angle** you are **using** (θ) it is the **angle opposite** θ
adjacent side	this side **depends** on the **angle** you are **using** (θ) it is the **angle next to** θ
sine	$sin\theta = \dfrac{opposite}{hypotenuse}$
cosine	$cos\theta = \dfrac{adjacent}{hypotenuse}$
tangent	$tan\theta = \dfrac{opposite}{adjacent}$
SOHCAHTOA	to remember: $S = \dfrac{o}{h} \quad C = \dfrac{a}{h} \quad t = \dfrac{o}{a}$

EXACT TRIG VALUES

	0°	30°	45°	60°	90°
sin	0	$\dfrac{1}{2}$	$\dfrac{\sqrt{2}}{2}$	$\dfrac{\sqrt{3}}{2}$	1
cos	1	$\dfrac{\sqrt{3}}{2}$	$\dfrac{\sqrt{2}}{2}$	$\dfrac{1}{2}$	0
tan	0	$\dfrac{1}{\sqrt{3}}$	1	$\sqrt{3}$	----

TRANSFORMATIONS

translation	**translate** means to **move a shape** the shape **does not change (congruent)** to translate a shape **you need a vector** in the form $\begin{pmatrix} x \\ y \end{pmatrix}$
rotation	**to turn a shape** the shape **does not change (congruent)** to rotate a shape **you need a centre of rotation, the number of degrees to turn,** and **a direction of turn** (clockwise or anticlockwise)
reflection	reflection means to **flip a shape over a mirror line** the shape **does not change (congruent)** to reflect a shape **you need a mirror line**
enlargement	**to change the size** of a shape the shape **does change size (similar)** to enlarge a shape **you need a centre of enlargement** and **a scale factor** of enlargement an enlargement with a frac**tional scale factor makes** the shape **smaller** an enlargement with a **negative scale factor changes the size** and **flips** a shape
invariant points	**points** on a line or shape which **do not move when** a specific **transformation** is **applied**

OTHER NON-LINEAR GRAPHS

sine graph	$y = sin(x)$ important points: (0,0), (90,1), (180,0), (270,-1), (360,0)	
cosine graph	$y = cos(x)$ important points: (0,0), (90,-1), (180,0), (270,1), (360,0)	
tangent graph	$y = tan(x)$ the graph has **asymptotes** at **x=90° and x=270°** important points: (0,0), (180,0), (360,0)	