Year 11 Higher| |Term 1 | Knowledge Organiser

## Transformations

| Transformations |  |  |
| :---: | :---: | :---: |
| 1 | Enlarge | To make a shape bigger or smaller by a given scale factor |
| 2 | Scale factor | The multiple describing how much a shape has been enlarged |
| 3 | Line of symmetry | A line that passes through the centre of a shape with a mirror image on either side |
| 4 | Reflect | Mapping of one object from one position to another of equal distance from a given line |
| 5 | Rotate | Movement around a fixed point by a certain number of degrees |
| 6 | Translation | When an object is moved from one place to another by a given vector |
| 7 | Invariant | A point that does not move after a transformation |
| 8 | Horizontal | A straight line parallel with the $x$-axis |
| 9 | Vertical | A straight line parallel with the $y$-axis |

## Bearings

| 1 | Cardinal <br> directions | North, South, East, West |
| :--- | :--- | :--- |
| 2 | Bearing | The angle in degrees measured <br> clockwise from North |
| $\mathbf{3}$ | Clockwise | Moving in the direction of the hands <br> of a clock |
| $\mathbf{4}$ | Protractor | An instrument used for measuring or <br> drawing angles |
| $\mathbf{5}$ | Construct | To draw accurately using a compass, <br> protractor and ruler |
| $\mathbf{6}$ | Scale | The ratio of the length of a drawing <br> to the length of the real thing |
|  |  | Circle Theorems |

## Angle in a

 semicircle is $90^{\circ}$

Angle between radius and tangent is $90^{\circ}$

Opposite angles in a cyclic quadrilateral add to $180^{\circ}$


Angles in the same segment are equal


Alternate segment theorem

## Volume \& Surface Area

1 Volume
The amount of size within a 3D shape

2 Volume

## Units -

$\mathrm{m}^{3}, \mathrm{~cm}^{3}, \mathrm{~mm}^{3}$ etc
The total areas of
3 Surface Area each face of a 3D shape
A 3D shape that has
the same crosssection all the way along it
length $\times$ width $\times$ height
area of cross

- section
$\times$ length


8 Volume of a

$$
\pi r^{2} h
$$

cone

$$
\frac{1}{3} \pi r^{2} h
$$

9 Volume of a pyramid
$\frac{1}{3} \times$ area of base
$\times$ height

## Volume of a sphere

$\frac{4}{3} \pi r^{3}$

