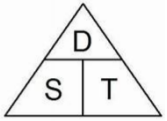
Year 10 Higher Unit One Knowledge Organiser – Graphs – The Basics, Real Life Graphs, Linear Graphs and Co-ordinate Geometry, Quadratic, Cubic and Other Graphs, Area, Perimeter and Circles

Graphs: The Basics and Real Life Graphs			
1	Axis	The 'x' and 'y' lines that cross at right angles.	
2	Co-ordinate	A pair of numbers that show an exact position. (x, y)	
3	$x\ co-ordinate$	Describes the movement left or right from (0,0). - moves left, + moves right	
4	$y\ co-ordinate$	Describes the movement up or down from (0,0). - moves down, + moves up	
5	Quadrant	The 4 areas made when we divide up a plane by an x and y axis.	
6	Midpoint	The middle of a line or line segment.	
7	Line Segment	Part of a line that connects two points.	
8	Distant-time graphs	Travel graph representing distance on y axis against time on x axis.	
9	Speed	The rate at which something moves. $Speed = \frac{Distance}{Time}$	
10	Velocity	The speed something is moving with its direction.	
11	Velocity-time graph	Travel graph representing speed on y axis against time on x axis.	
12	Rate of change	The speed at which a variable changes over a specific period of time.	
Linear Graphs			
1	Sketch	A drawing to show the general shape of a graph.	
2	Straight line graphs	$y = mx + c$	m = gradient c = y intercept
3	Y intercept (c)	Where the line crosses the y axis.	
4	Gradient	The steepness of a line.	$\frac{Change\ in\ y}{Change\ in\ x}$ $= \frac{y_2 - y_1}{x_2 - x_1}$

5	Parallel lines	Lines with the same gradient.	
6	Linear Function	Where the graph of the equation forms a straight line.	
7	Rearrange	To change the subject of a formula.	
8	Subject of a formula	The letter on its own one side of the equal's sign.	
Linear Graphs and Co-ordinate Geometry			
1	Plot	To draw a graph.	
2	Linear Function	Where the graph of the equation forms a straight line.	
3	Common straight line graphs	y = a	A horizontal line that cuts through the y axis at point *a.*
		x = a	A vertical line that cuts through the x axis at point *a.*
		y = x	A diagonal line that crosses through the origin where the values of x and y are the same.
		y = -x	A diagonal line that crosses through the origin where the x co-ordinate is multiplied by -1 to get the y co-ordinate.
4	Parallel lines	Lines with the same gradient.	
5	Perpendicular Lines	Two lines that meet at 90°.	
6	Gradient of perpendicular Lines	The gradient of perpendicular lines multiply to make -1.	
Quadratic, Cubic and Other Graphs			
1	Linear Graph	A straight-line graph.	
		$y = mx + c$	
		Positive mx 	
		Negative mx 	
2	Quadratic Graph	A curved graph.	
		$y = ax^2 + bx + c$	
		Positive ax^2	′ ∪′ shape
		Negative ax^2	′ ∩ ′ shape

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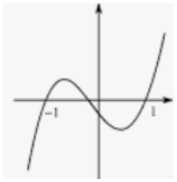
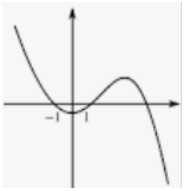
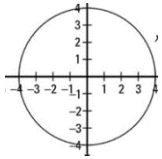
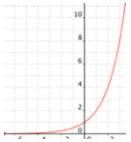
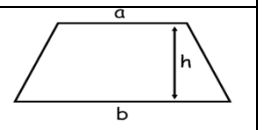
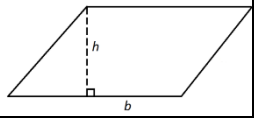
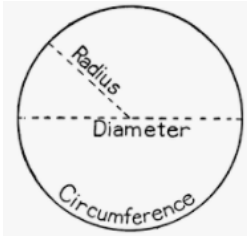
3	Cubic Graph	A curved graph.	Positive ax^3	
		$y = ax^3 + bx^2 + cx + d$	Negative ax^3	
4	Reciprocal Graph	A graph that creates a hyperbola. It has a vertical and horizontal asymptote.	$y = \frac{k}{x}$	$y = \frac{-k}{x}$
				
5	Asymptote	A line that a curve approaches, as it heads towards infinity.		
6	Circle graph	A circle graph. $x^2 + y^2 = r^2$		
7	Exponential Graph	A graph that increases rapidly in the y direction and will never fall below the x-axis. A graph in the form $y = k^x$.		

8	Solution to a Quadratic Graph	Where the graph cuts through the x axis/ y = 0.	
9	Roots of a Quadratic Equation	Were the graph cuts the x axis/ y = 0	
10	Y – intercept	The point in which the graph crosses the y axis. (c)	
11	Maximum Turning Point	Where the gradients of a graph changes from positive to negative.	
12	Minimum Turning Point	Where the gradients of a graph changes from negative to positive.	
Area, Perimeter and Circles			
1	Perimeter	The distance around the outside of a shape.	
2	Area of a Triangle	$\frac{base \times height}{2}$	
3	Perpendicular	Two lines that meet at 90°.	
4	Area of a Trapezium	$\frac{1}{2}(a+b)h$ Where a and b are the two parallel sides.	
5	Area of a Parallelogram	$b \times h$ Base x perpendicular height	
Circles			
1	Pi (π)	A Greek letter used to represent the ratio of a circle's circumference to its diameter.	
2	Radius (r)	From a point on the circumference to the centre.	
3	Diameter (d)	From a point on the circumference to another point on the circumference, through the centre.	

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4	Area of a Circle	πr^2	
5	Circumference	πd	The perimeter of a circle.
6	Segment	A region that is created by the arc and a chord of a circle.	
7	Chord	A line segment joining to points on a circle's circumference.	
8	Arc	Part of a circumference of a circle.	
9	Sector	The area between two radiuses and the connecting arc.	
10	Arc length	$\frac{\theta}{360}$ x $2\pi r$	
11	Area of a sector	$\frac{\theta}{360}$ x πr^2	