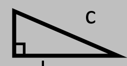
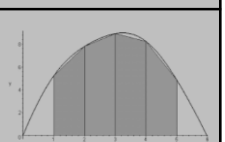
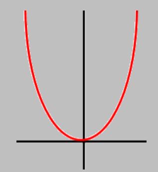
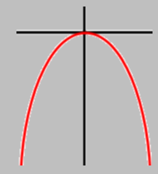
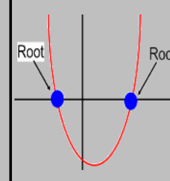
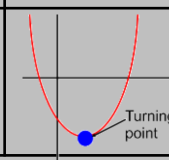
Year 10 Unit 2: Algebraic Graphs

COORDINATES	
line segment	a line joining **two points**
length of line segment	**distance** between two points calculated using **Pythagoras' theorem**.
Pythagoras' theorem	a relationship between the **3 sides** on a **right angled triangle**  **$a^2 + b^2 = c^2$**
midpoint (3,2)	the **middle** of a **line segment**

LINEAR GRAPHS	
y = mx + c	the **general equation** of a **linear graph** **m** is the **gradient** **c** is the **y-intercept** **when plotting:** use a **table of values, substitute** in values of **'x'** to generate **'y', plot the coordinates, join with line**
gradient	how **steep** a line is can be positive or negative **$\frac{\text{(Change in y)}}{\text{(Change in x)}}$ or $\frac{dy}{dx}$** It gives the **rate of change**
y- intercept	where the line **crosses** the **y-axis (0, a)**
equation from gradient and a point	**substitute** the **gradient** for 'm', and the 'x' and 'y' values from the **coordinates** to find 'c' re-write the equation in the form y = **mx + c**
equation from two points	find the **gradient** using **dy/dx**, then use the method as above
parallel lines	lines with the **same gradient** ('**m' is the same**) they **never meet** they are always the **same distance apart**
perpendicular lines	two lines that meet at a **right angle (90°)** the **product** of the **two gradients** is always **-1** the gradient of one line will be the **negative reciprocal** of the **gradient** of the other line

REAL LIFE GRAPHS		
gradient of a curve	the **gradient of a curve at a point** is the **same as** the **gradient** of the **tangent at that point**	
tangent to a curve	a **straight line** that **touches** a **curve** at **exactly one point**	
area under a curve	**to estimate** the **area under a curve, split it up** into **simpler shapes** – such as **rectangles, triangles** and **trapeziums**	

QUADRATIC GRAPHS		
quadratic graph	a graph where the **highest power** of x is **x^2** it is always a **parabola** (a **U-shape**)	
	$y = x^2$	
	$y = -(x^2)$	
roots (of graphs)	the '**solutions**' of a graph, where a **function equals zero** can be found in a graph where the **curve meets the x axis**	
turning point	the point where a graph **turns**, from negative to positive gradient or positive to negative gradient	
sketching quadratics	decide if it is a **U** or **∩** shape **factorise** to find the **roots**, mark them on complete the **square** to find the **turning point**, mark it on use the '**d**' value as the **y-intercept**, mark it on	

SOLVING QUADRATIC EQUATIONS	
quadratic	a **polynomial** where the highest power of x is **x^2**
solving a quadratic	finding the **roots of the graph** there are usually **two** roots / **solutions**
general quadratic equation	a quadratic equation is of the form ***$ax^2 + bx + c = 0$*** where **a, b and c are numbers**, a ≠ 0
the quadratic formula	$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
factor	a **quantity** which **divides equally** into a number, e.g. *factors of 8 are 1, 2, 4 and 8*
factorising a general quadratic	quadratic: **$x^2 + bx + c$** factorised form: **(x + ?)(x + ?)** '?' are **two numbers** whose **product is 'c'** and **sum is 'b'**
difference of two squares	quadratic: **$a^2 - b^2$** factorised form: **(a – b)(a + b)** **square root each number** from the **original expression**
completing the square	a quadratic in the form $x^2 + bx + c$ written in the form $(x + p)^2 + q$ the turning point of the quadratic is **(-p,q)**