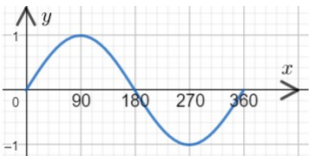
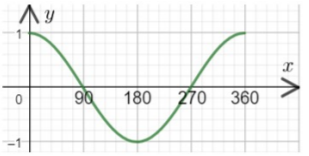
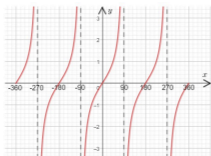


MATHEMATICS - YEAR 11 HIGHER – PART 2

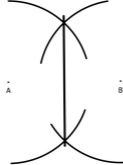
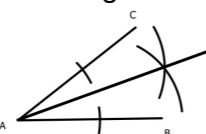
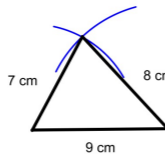
A		VECTORS
1	Vector	A vector is a straight arrow, pointing in one direction. It has a size and direction.
2	Column notation	A column vector is written: $\begin{pmatrix} x \\ y \end{pmatrix}$ x is movement along the x axis (horizontal) y is movement along the y axis (vertical)
3	Vector notation	Vectors can be written using letters, e.g. \mathbf{a} The vector $\vec{AB} = \mathbf{a}$
4	Negative vectors	If the vector $\vec{AB} = \mathbf{a}$, the vector $\vec{BA} = -\mathbf{a}$ The vectors are equal in size, but point in the opposite direction.
5	Adding and subtracting vectors	Add the x parts of the vector and add the y parts. For example: $\begin{pmatrix} 4 \\ 5 \end{pmatrix} + \begin{pmatrix} 3 \\ -1 \end{pmatrix} = \begin{pmatrix} 7 \\ 4 \end{pmatrix}$
6	Multiplying a vector by a scalar	Multiply the x and y parts of the vector by the scalar. For example: $3 \begin{pmatrix} 4 \\ 5 \end{pmatrix} = \begin{pmatrix} 12 \\ 15 \end{pmatrix}$
7	Parallel vectors	Vectors are parallel if they contain a common factor For example: $\mathbf{a} + 2\mathbf{b}$ and $3(\mathbf{a} + 2\mathbf{b})$

B		TRIGONOMETRIC GRAPHS
1	$y = \sin x$	
2	$y = \cos x$	
3	$y = \tan x$	

C		TRANSFORMATIONS
1	The 4 transformations	<ul style="list-style-type: none"> • Translation • Rotation • Reflection • Enlargement
2	Translation	Requires: <ul style="list-style-type: none"> • A column vector
3	Rotation	Requires: <ul style="list-style-type: none"> • The degrees (90° or 180°) • The direction (clockwise/anti-clockwise) • The centre of rotation
4	Reflection	Requires: <ul style="list-style-type: none"> • The equation of the mirror line
5	Enlargement	Requires: <ul style="list-style-type: none"> • A scale factor • The centre of enlargement
6	A negative enlargement scale factor 1 is the same as...	<ul style="list-style-type: none"> • A rotation of 180 degrees

B		ITERATIVE PROCESSES
1	Term-to-term rule	A rule for a sequence that describes how to get from one term to the next
2	x_n	A term
3	x_{n+1}	The next term
4	x_{n-1}	The previous term
5	Show that an equation has a solution between two values	Substitute the two values into the equation. For example, to show that $x^3 + 4x = 1$ has a solution between 0 and 1, substitute in 0 and 1: $0^3 + 4 \times 0 = 0$ and $1^3 + 4 \times 1 = 5$ Hence, a solution must exist between 0 and 1.

MATHEMATICS - YEAR 11 HIGHER – PART 2

A LOCI & CONSTRUCTIONS		
1	Construct a circle (e.g. 5cm)	<ul style="list-style-type: none"> Set your compasses to 5cm Place your compasses on the centre and construct a circle (radius 5cm)
2	Construct a perpendicular bisector	<ul style="list-style-type: none"> Place your compasses on either point, then spread them to over half way Draw an arc, then repeat from the other point Join the intersecting arcs with a line 
3	Construct an angle bisector	<ul style="list-style-type: none"> Make a small arc on both lines Place your compasses on the line/arc intersection and create two new arcs at the top (same distance) Draw a line connecting the arcs with the centre of the angle 
4	Construct a triangle using SSS	<ul style="list-style-type: none"> Draw the longest side using a ruler Draw arcs for each of the other sides from the line Join with a ruler 
5	A set of points a fixed distance from a point	Construct a circle
6	A set of points equidistant from two points	Construct a perpendicular bisector
7	A set of points equidistant from two sides	Construct an angle bisector

B TRANSFORMING GRAPHS		
1	$y = f(x) + a$	<ul style="list-style-type: none"> A translation by vector $\begin{pmatrix} 0 \\ a \end{pmatrix}$ If a is positive, the graph will move upwards If a is negative, the graph will move downwards
2	$y = f(x + a)$	<ul style="list-style-type: none"> A translation by vector $\begin{pmatrix} -a \\ 0 \end{pmatrix}$ If a is positive, the graph will move left If a is negative, the graph will move right
3	$y = -f(x)$	<ul style="list-style-type: none"> A reflection in the x-axis
4	$y = f(-x)$	<ul style="list-style-type: none"> A reflection in the y-axis