Mathematics Year 10 – HT1 – Algebraic Thinking – Tier 2 Vocabulary (words in bold are higher only)

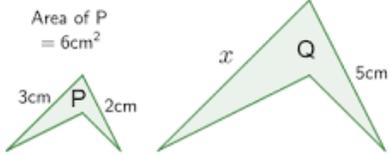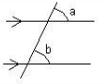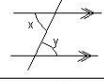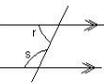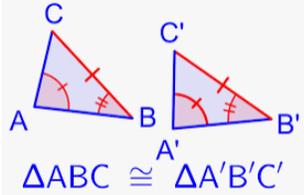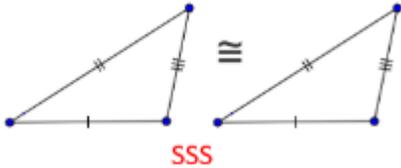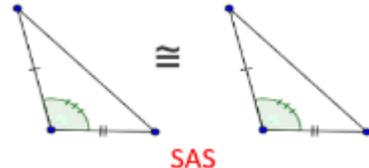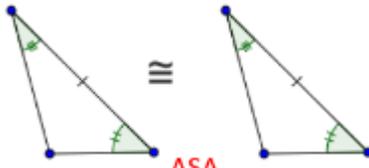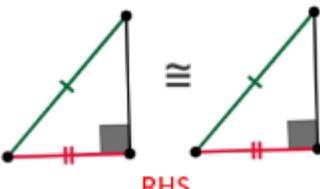| Vocabulary	Definition	Example
Ratio	A ratio shows the relative sizes of two or more values.	Example: if there is 1 boy and 3 girls you could write the ratio as: 1:3 (for every one boy there are 3 girls)
Scale Factor	This is a multiplier that changes the size of an object.	If a square has a length of 6cm and you apply a scale factor of 2.5 then the new square has a length of 15cm (6 x 2.5 = 15)
Reflection	An image or shape as it would be seen in a mirror.	
Proportion	When quantities have the same relative size. In other words they have the same ratio.	The lengths of these two shapes are proportional: every matching side on the larger shapes is twice as large as on the smaller shape.
Parallel	Always the same distance apart and never touching.	Here the red and blue line segments are parallel.
Inverse	Opposite in effect. The reverse of.	The inverse of adding 9 is subtracting 9. The inverse of multiplying by 5 is dividing by 5.
Surd	A number that can't be simplified to remove a square root.	√2 (square root of 2) can't be simplified further so it is a surd • √4 (square root of 4) CAN be simplified to 2, so it is NOT a surd
Infinity	An idea that something never ends. It is sometimes used like a number but it is not really.	The symbol is ∞
Approaching	This means when a value is getting closer to another value.	
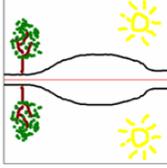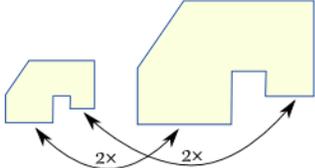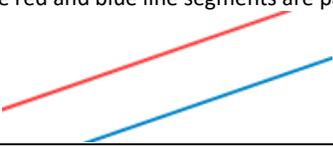
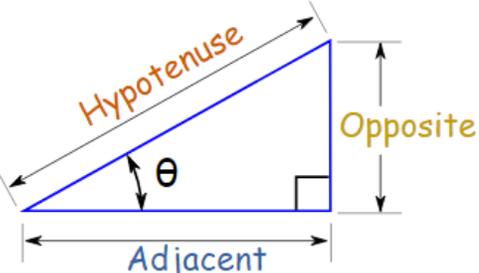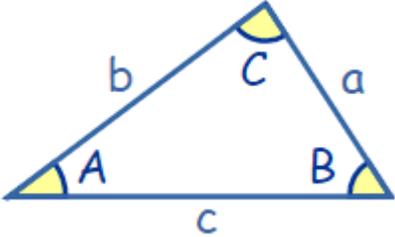# Mathematics Year 10 – HT1 – Algebraic Thinking – Tier 3 Vocabulary (words in bold are higher only)

Vocabulary	Definition	Example
Enlarge	To make larger.	For example, if you enlarge a 2cm square by a scale factor of three then its sides are now 6cm in length.
Origin	The starting point. On a number line it is 0 On a two-dimensional graph it is where the X axis and Y axis cross, such as on the graph here:	
Image	When you transform an object (shape) by reflecting, rotating, translating or enlarging then what happens to the object and where it ends up is called the image.	
Object	A shape or a coordinate before it undergoes a transformation.	
Fractional Scale Factor	When the scale factor is fractional and the shape decreases in size, we still call it an enlargement.	Therefore, a scale factor of 1/2 means that the side-lengths of the new shape are half the side-lengths of the original.
Centre of Enlargement	Enlargement is described by its scale factor and the position is described by the centre of enlargement.	
Similar	Two shapes are said to be mathematically similar if all of the angles in the shapes are equal, but the shapes are not necessarily the same size.	Area of P = 6cm² 3cm P 2cm x Q 5cm
Corresponding	When two lines are crossed by another line (which is called the Transversal), the angles in matching corners are called corresponding angles.	a and b are **corresponding angles**. a = b
Alternate	When two lines are crossed by another line (the Transversal), a pair of angles • on the inner side of each of those two lines • but on opposite sides of the transversal are called Alternate Interior Angles.	x and y are **alternate angles**. x = y
Co-interior	Co-interior angles lie between two lines and on the same side of a transversal. In each diagram the two marked angles are called co-interior angles. If the two lines are parallel, then co-interior angles add to give 180º and so are supplementary.	r and s are **co-interior angles**. r + s = 180º
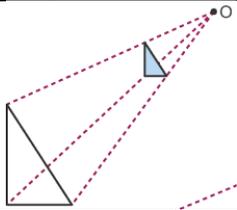
Length Scale Factor	When enlarging a shape by a length scale factor, you multiply each side of the shape by the scale factor.	For example, when enlarging a square of length 5cm by a length scale factor of 2.5 the length of the image square will be 12.5cm (5 x 2.5 = 12.5)
Congruent	Two shapes are said to be congruent when they have exactly the same angles and the same lengths of sides. They will coincide exactly when superimposed.	$\triangle ABC \cong \triangle A'B'C'$
Side-Side-Side (SSS)	The side-side-side postulate states that if the three sides of one triangle are congruent to the corresponding sides to another triangle, then the two triangles are congruent. This includes the angles of the two triangles as well.	SSS
Side-Angle-Side (SAS)	The Side Angle Side postulate (often abbreviated as SAS) states that if two sides and the included angle of one triangle are congruent to two sides and the included angle of another triangle, then these two triangles are congruent.	SAS
Angle-Side-Angle (ASA)	The ASA (Angle-Side-Angle) postulate states that if two angles and the included side of one triangle are congruent to two angles and the included side of another triangle, then the triangles are congruent. (The included side is the side between the vertices of the two angles.)	ASA
Right Angle-Hypotenuse-Side (RHS)	Two triangles triangle are congruent if the hypotenuse and one side of the one triangle are respectively equal to the hypotenuse and one side of the other.	RHS
Proof	Logical mathematical arguments used to show the truth of a mathematical statement. In a proof we can use: • axioms (self-evident truths) such as "we can join any two points with a straight line segment" (one of Euclid's Axioms) • existing theorems, that have themselves been proven. The result of a proof is often called a theorem.	
Opposite	In a right-angled triangle the 'opposite' side is the side that is opposite or faces the given angle	
Adjacent	In a right-angled triangle the 'adjacent' side is the side that is next to the given angle	
hypotenuse	In a right-angled triangle, the 'hypotenuse' is the longest side and is always opposite the right angle.	
sine	In a right angled triangle, the sine of an angle is: The length of the side opposite the angle divided by the length of the hypotenuse. The abbreviation is sin **sin θ = opposite / hypotenuse**	

cosine	In a right angled triangle, the cosine of an angle is: The length of the adjacent side divided by the length of the hypotenuse. The abbreviation is cos **cos(θ) = adjacent / hypotenuse**	
tangent	In a right angled triangle, the tangent of an angle is: The length of the side opposite the angle divided by the length of the adjacent side. The abbreviation is tan **tan(θ) = opposite / adjacent**	
Negative scale factor	An enlargement with a negative scale factor produces an image on the other side of the centre of enlargement. The image appears upside down.	
Area Scale factor	This is what the area of a shape is multiplied by if enlarged. If the length of a side is increased by a scale factor of K then the area increases by a scale factor of K^2.	Area scale factor The **lengths** of the larger square are 3 times longer than the smaller square. The length **scale factor** is 3. The **area** of the smaller square is 9 cm². The area of the larger square is 81 cm². The area of the larger square is nine times larger than the area of the smaller square. The area scale factor is 9. This is the length scale factor squared.
Volume Scale factor	This is what the volume of a 3d shape is multiplied by if enlarged. If the length of an edge is increased by a scale factor of K then the area increases by a scale factor of K^3	Volume scale factor The lengths of the larger square are 4 times longer than the smaller square. The length scale factor is 4. The **volume** of the smaller cube is 8 cm³. The volume of the larger cube is 512 cm³. The volume scale factor is 64. This is the length scale factor cubed.
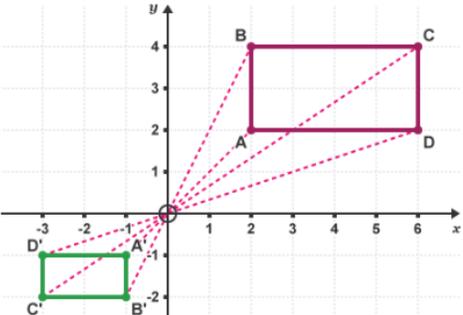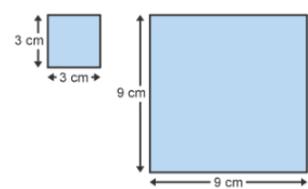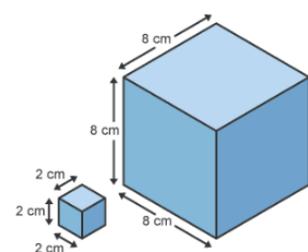
Sine rule	For any triangle, the Law of Sines (also called the Sine Rule) says: **a / sin(A) = b / sin(B) = c / sin(C)** In other words, a side's length divided by the sine of the opposite angle is the same for all three sides.	
Cosine rule	For any triangle, the Law of Cosines says: **c² = a² + b² − 2ab cos(C)** Where: • a, b and c are the three sides of the triangle, and • C is the angle opposite side c	