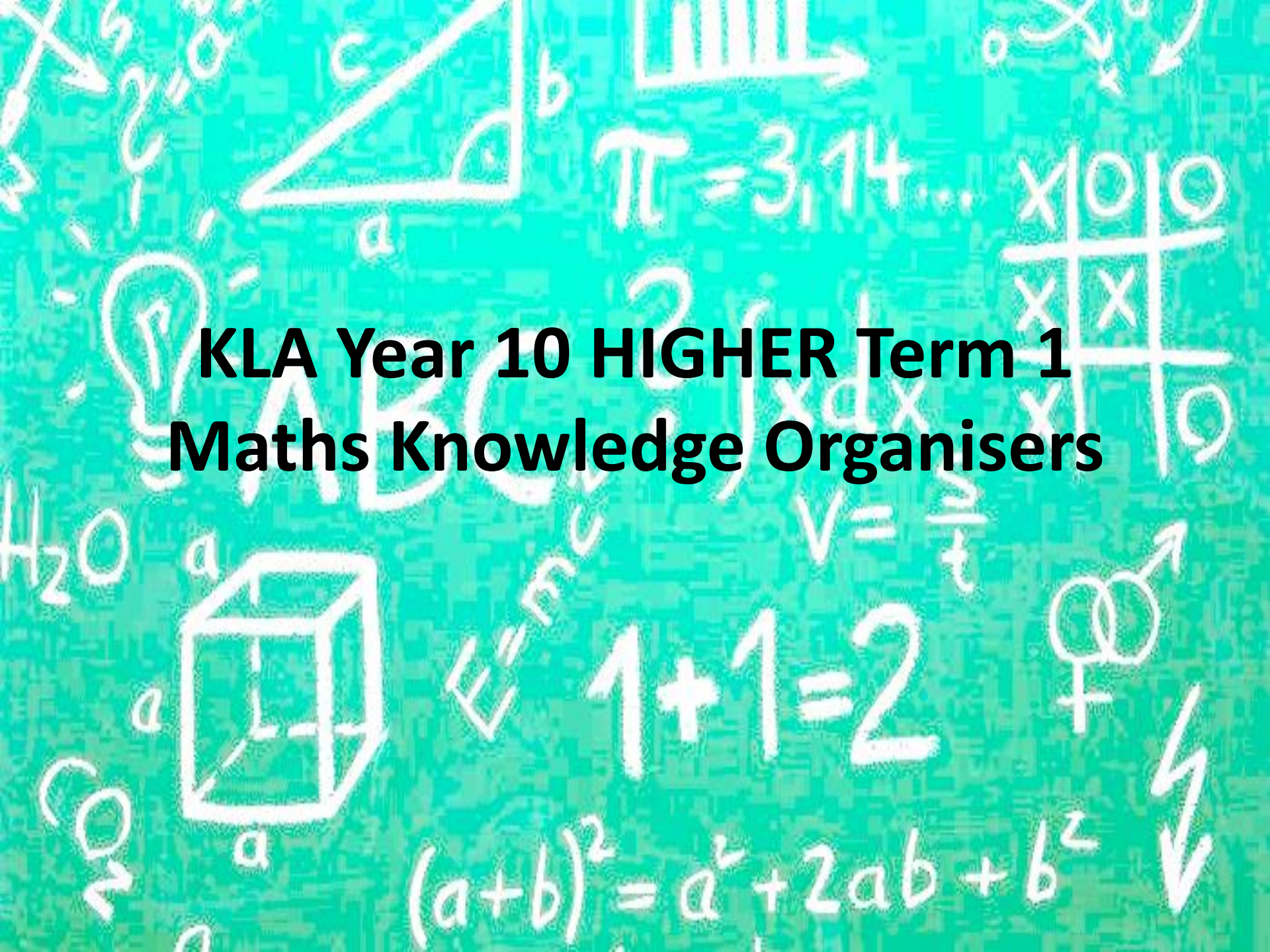


**KLA Year 10 HIGHER Term 1  
Maths Knowledge Organisers**



# Year 10 – Higher Knowledge Organiser Half Term 1

## Key Topics and Vocabulary

## Recap of Year 9 Knowledge Organiser

## Pythagoras theorem and basic trigonometry

Trigonometry


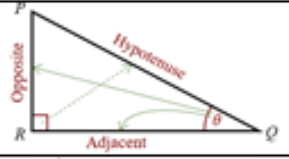

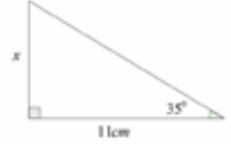
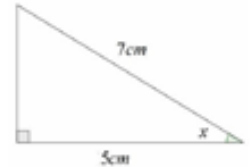
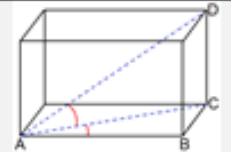
Hypotenuse

Adjacent

Trigonometric

Formulae

3D Trigonometry

Topic/Skill	Definition/Tips	Example
1. Trigonometry	The study of triangles.	
2. Hypotenuse	The longest side of a right-angled triangle.  Is always <b>opposite</b> the right angle.	
3. Adjacent	Next to	
4. Trigonometric Formulae	Use <b>SOHCAHTOA</b> .  $\sin \theta = \frac{O}{H}$  $\cos \theta = \frac{A}{H}$  $\tan \theta = \frac{O}{A}$    When finding a missing angle, use the 'inverse' trigonometric function by pressing the 'shift' button on the calculator.	  Use 'Opposite' and 'Adjacent', so use 'tan' $\tan 35 = \frac{x}{11}$ $x = 11 \tan 35 = 7.70 \text{ cm}$    Use 'Adjacent' and 'Hypotenuse', so use 'cos' $\cos x = \frac{5}{7}$  $x = \cos^{-1}\left(\frac{5}{7}\right) = 44.4^\circ$
5. 3D Trigonometry	Find missing lengths by <b>identifying right angled triangles</b> .  You will often have to find a missing length you are not asked for before finding the missing length you are asked for.	

# Year 10 – Higher Knowledge Organiser Half Term 2

## Key Topics and Vocabulary

### Algebra quadratics, rearranging formulae and identities

Quadratic

Factorising Quadratics

Difference of Two Squares

Solving Quadratics

( $ax^2 = b$ )

Solving Quadratics

( $ax^2 + bx = 0$ )

Solving Quadratics by

Factorising

( $a = 1$ )

Factorising Quadratics

when  $a \neq 1$

Solving Quadratics by

Factorising

### Collecting and representing

data (continues into

Statistical measures next

half term)

Topic/Skill	Definition/Tips	Example
1. Quadratic	A quadratic expression is of the form  $ax^2 + bx + c$  where $a, b$ and $c$ are numbers, $a \neq 0$	Examples of quadratic expressions: $x^2$ $8x^2 - 3x + 7$  Examples of non-quadratic expressions: $2x^3 - 5x^2$ $9x - 1$
2. Factorising Quadratics	When a quadratic expression is in the form $x^2 + bx + c$ find the two numbers that <b>add to give b and multiply to give c.</b>	$x^2 + 7x + 10 = (x + 5)(x + 2)$ (because 5 and 2 add to give 7 and multiply to give 10)  $x^2 + 2x - 8 = (x + 4)(x - 2)$ (because +4 and -2 add to give +2 and multiply to give -8)
3. Difference of Two Squares	An expression of the form $a^2 - b^2$ can be factorised to give $(a + b)(a - b)$	$x^2 - 25 = (x + 5)(x - 5)$ $16x^2 - 81 = (4x + 9)(4x - 9)$
4. Solving Quadratics ( $ax^2 = b$ )	Isolate the $x^2$ term and square root both sides. Remember there will be a <b>positive and a negative solution.</b>	$2x^2 = 98$ $x^2 = 49$ $x = \pm 7$
5. Solving Quadratics ( $ax^2 + bx = 0$ )	<b>Factorise and then solve = 0.</b>	$x^2 - 3x = 0$ $x(x - 3) = 0$ $x = 0$ or $x = 3$

Year 10 - Higher  
**Maths**  
**Knowledge Questions**

Below are a series of questions.

Use these to apply your knowledge and practice.

**Circumference and area**

Is the diameter of a circle also a chord? Why or why not?  
 What's the difference between a segment and a sector?

**Pythagoras theorem**

Which term in Pythagoras' theorem represents the hypotenuse? Does it matter which of the shorter two sides is  $a$  and which is  $b$ ?

**Basic Trigonometry**

Will the ratio remain constant if the given angle gets bigger/smaller? Why/Why not?

**Algebra quadratics, rearranging formula and identities**

Which letter is the subject of the formula? How do you know?

**Collecting and representing data**

Why do statisticians take samples rather than interview the whole population?

Year 10 - Higher  
**Maths**  
**Knowledge Checklist**

KNOWLEDGE  
 PROGRESS

KNOWLEDGE CHECKLIST		R	A	G
1	Circumference and area			
2	Pythagoras theorem			
3	Basic trigonometry			
4	Algebra quadratics, rearranging formula and identities			
5	Collecting and representing data			
6				
7				
8				
9				
10				

**High Flyers - Enrichment Task**



Use the information on the first triangle to find the missing values  $x$  on the following two triangles.

