Knowledge Organiser

Lent Term Set 1 Year 10

Topic	Self-Assessment	Independent Learning and homework tasks	
		MyMaths	CorbettMaths.com
Calculate density and pressure (4)		N/A	Video 384, 385
Calculate volume & surface area of cones, pyramids & spheres (5/6). Calculate rates of flow in/out of containers (8).		Shape, Volume & Surface Area – Volume of Cones & Spheres, Complex Surface Areas	Video 359 - 361
Enlarging similar shapes – use of volume & SA scale factors (6)		Shape, Scale & Similarity – Area Scale Factor, Volume Scale Factor	Video 293a, b
Be able to draw quadratic graphs (5) and use them to solve quadratic equations (7)		Algebra, Graphs – Plotting Graphs	Video 264
Determining the equations of straight line graphs (4/5)		Algebra, Graphs y=mx+c	Videos 187-191
Finding the equations of parallel and perpendicular lines (7)		Algebra, Graphs – Equation of a Line 2	Videos 196-197
Be able to calculate missing angles using angle rules (3)		Shape, Angles – Angles in Parallel Lines & Interior Exterior Angles	Video 25
Understand, prove and use the rules for angles in circles (8)		Shape, Circle Theorems – Intersecting Chords, Circle Theorem Proof	Videos 64 - 65
Be able to expand triple brackets (7)		GCSE (9-1) Eng: Algebra, Algebraic Manipulation, Expanding Three Binomials	Video 15
Factorising quadratic expressions and solving quadratic equations by factorising (6).		Algebra, Equations – quadratic, Quadratic equations 1 & 2	Video 266
Simplify and manipulate surds (7/8).		Number, Powers & Roots, Surds 1 & 2	Videos 305 - 308
Rationalise the denominator of a surd (9).		Number, Powers & Roots, Surds 2	Video 307

Stretch and Challenge:

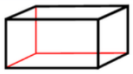
1) Practise UKMT Intermediate Maths Challenge Past papers on: https://www.ukmt.org.uk/competitions/solo/intermediate-mathematical-challenge/archive

2) Set up an account on parallel.org.uk website, using your school email address and use teacher code "**ha52kh**"

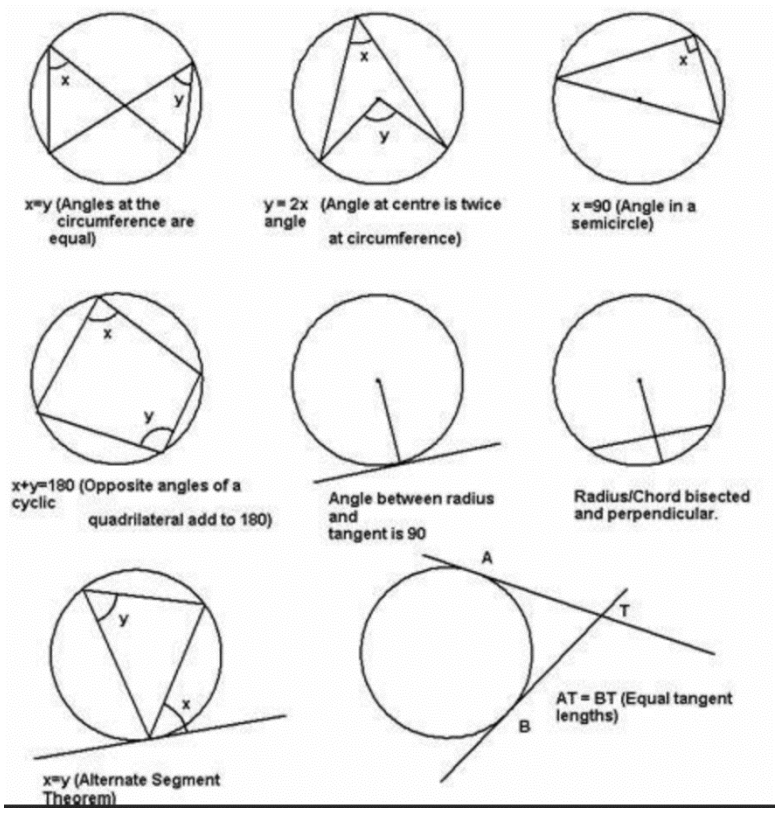
3) Attend Puzzle Club one lunch time each week

Lent Term Knowledge

Volume and Surface Area of 3D shapes

Figure	Shape	Volume	C.S.A./L.S.A.	Total Surface Area
	CUBOID	l b h	2 lh + 2bh	2lh + 2bh + 2lb
	CUBE	a^3	$4a^2$	$6a^2$
	CYLINDER	$\pi r^2 h$	$2\pi rh$	$2\pi r(h + r)$
	CONE	$\frac{1}{3}\pi r^2 h$	$\pi r l$	$\pi r (l + r)$
	SPHERE	$\frac{4}{3}\pi r^3$	$4\pi r^2$	$4\pi r^2$
	HEMI-SPHERE	$\frac{2}{3}\pi r^3$	$2\pi r^2$	$3\pi r^2$

Circle Theorems



THE RULES OF SURDS

1) $\sqrt{a} \times \sqrt{b} = \sqrt{(ab)}$

2) $\sqrt{a} / \sqrt{b} = \sqrt{(a/b)}$

3) $\sqrt{a} + \sqrt{b}$ - can't simplify

4) $(a+\sqrt{b})^2 = (a+\sqrt{b})(a+\sqrt{b})$
$= a^2 + 2a\sqrt{b} + b$

5) $(a+\sqrt{b})(a-\sqrt{b})$
$= a^2 + a\sqrt{b} - a\sqrt{b} - b = a^2 - b$

6) $a / \sqrt{b} = (a\sqrt{b})/b$

Rationalising the Denominator

If the denominator contains $\sqrt{a}$

Multiply by $\frac{\sqrt{a}}{\sqrt{a}}$

If the denominator contains $\sqrt{a} + \sqrt{b}$

Multiply by $\frac{\sqrt{a} - \sqrt{b}}{\sqrt{a} - \sqrt{b}}$

You can swap the '–' and the '+' signs.

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