Beckfoot

Subject: Maths	Term: Half Term 1- June	Year Group: 10F

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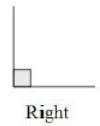
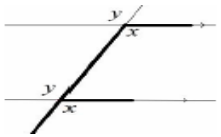
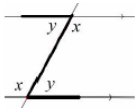
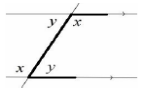
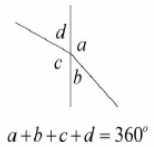
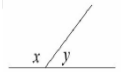
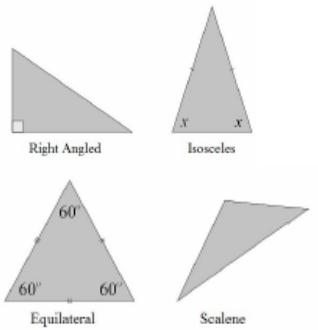
Geometry and Measure – Angles

1	Acute Angle	**Acute angles** are less than 90°.
2	Obtuse Angle	**Obtuse angles** are greater than 90° but less than 180°.
3	Reflex Angle	**Reflex angles** are greater than 180° but less than 360°.
4	Right Angle 	**Right angles** are exactly 90°.
5	Corresponding Angles 	**Corresponding angles are equal**. They look like F angles, but never say this in the exam.
6	Alternate Angles 	**Alternate angles are equal**. They look like Z angles, but never say this in the exam.
7	Co-Interior Angles (Also called supplementary) 	**Co - Interior angles add up to 180°**.

Number – Fractions and Decimals

1	Multiplying Fractions	**Multiply** the **numerators** together and **multiply** the **denominators** together.
2	Dividing Fractions	**'Keep it, Flip it, Change it – KFC'**
3	Adding or Subtracting Fractions	Find the **LCM of the denominators** to find a common denominator. Use equivalent fractions to change each fraction to the **common denominator**. Then just **add or subtract the numerators** and keep the **denominator the same**.

8	Angles at a Point  $a+b+c+d=360°$	**Angles around a point add up to 360°**.
9	Angles on a straigh  $x+y=180°$	**Angles around a point on a straight line add up to 180°**.
10	**Right Angle** Triangles have a **90°** angle in. **Isosceles** Triangles have **2 equal sides** and **2 equal base angles**. **Equilateral** Triangles have **3 equal sides** and **3 equal angles (60°)**. **Scalene** Triangles have **different sides** and **different angles**.	

Key Vocabulary

1	Integer	A **whole number** that can be positive, negative or zero.
2	Fraction	A number that represents a part of a whole. It consists of a numerator and a denominator. The numerator represents the number of equal parts of a whole, while the denominator is the total number of parts that make up said whole.
3	Reciprocal	To get the reciprocal of a number, we divide 1 by the number. Eg. the reciprocal of 2 is ½
4	Mixed Number	A number formed of both an **integer part** and a **fraction part**. $3\frac{2}{5}$ is an example of a mixed number.
5	Equivalent Fractions	Fractions which represent the **same value**. $\frac{2}{5}=\frac{4}{10}=\frac{20}{50}=\frac{60}{150}\ etc.$
6	Parallel Lines	Two or more lines which are equal distance apart (Think train tracks)
7	Perpendicular	Lines which cross at a 90 degree angle.

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Subject: Maths	Term: Half Term 2 - September	Year Group: 10F

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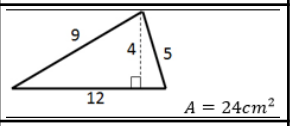
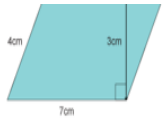
Algebra – Working with Symbols

1	Simplifying expressions **Collect 'like terms'.**	Be careful with negatives. x^2 and x are not like terms. $2x + 3y + 4x - 5y + 3 = 6x - 2y + 3$ $3x + 4 - x^2 + 2x - 1 = 5x - x^2 + 3$
2	Bracket Expansion	To expand a bracket, **multiply** each term **in the bracket** by the expression **outside** the bracket. $3(m + 7) = 3x + 21$
3	Factorise	The **reverse** of **expanding**. Factorising is writing an expression as a product of terms by '**taking out' a common factor**. $6x - 15 = 3(2x - 5)$, where 3 is the common factor.

Number - Percentages

1	Percentage multipliers	The multiplier for increasing by 12% is 1.12 The multiplier for decreasing by 12% is 0.88 (100% - 12%)
2	Percentage change	$\frac{(new\ value - original\ value)}{original\ value}$ x 100%
3	Reverse Percentage	A jumper was priced at £48.60 after a 10% reduction. Find its original price. 100% - 10% = 90% 90% = £48.60 1% = £0.54 100% = £54
4	Simplifying Ratios	**Divide** all parts of the ratio by a **common factor**. 5 : 10 = 1 : 2 (divide both by 5) 14 : 21 = 2 : 3 (divide both by 7)

Geometry and Measure – Area and Perimeter

1	Area of a rectangle/square **Length x Width**	$A = 36cm^2$
2	Area of a Triangle **Base x Height ÷ 2**	 $A = 24cm^2$
3	Area of a parallelogram **Base x Perpendicular Height**	 $A = 21cm^2$
4	Area of a Circle	$\boldsymbol{A = \pi r^2}$ which means 'pi x radius squared'.
5	Circumference of a Circle	$\boldsymbol{C = \pi d}$ which means 'pi x diameter'

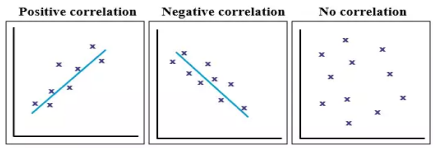
Ratio, Proportion and rates of change – Ratio

1	Unitary Method	Find the value of a single unit first, and then the value of the required number of units by multiplying

Key Vocabulary

1	Expression	A mathematical statement written using **symbols**, **numbers** or **letters**,
2	Percentage multipliers	The **number** you **multiply** a quantity by to **increase or decrease** it by a **percentage**.
3	Reverse percentage	Find the **correct percentage given in the question**, then work backwards to **find 100%** Look out for words like '**before**' or '**original**'
4	Perimeter	The **total distance** around the **outside** of a shape.
5	Area	The amount of **space inside** a shape.

Statistics – Scatter Graphs

1	Causality	When one variable influences another variable
2	Line of best fit	A straight line that best represents the data on a scatter graph
4	Positive, Negative or No Correlation	

Subject: Maths	Term: Half Term 3 - November	Year Group: 10F

Algebra - Equations

1	Solve an equation	**Use inverse operations** on both sides of the equation (balancing method) until you find the value for the letter.	Solve $2x - 3 = 7$ Add 3 on both sides $2x = 10$ Divide by 2 on both sides $x = 5$
2	Solve a quadratic by factorising:	Make sure the equation = 0 $ax^2 + bx + c = 0$ Use the products of ac that sum to b	

Geometry and Measure - Constructions

1	**Angle Bisector: Cuts the angle in half.** Angle Bisector	1. Place the sharp end of a pair of compasses on the vertex (corner). 2. Draw an arc, marking a point on each line. 3. Without changing the compass put the compass on each point and mark a centre point where two arcs cross over. 4. Use a ruler to draw a line through the vertex and centre point.
2	**Perpendicular Bisector: Cuts a line in half and at right angles.**	1. Put the sharp point of a compass on A. 2. Open the compass over half way on the line. 3. Draw an arc above and below the line. 4. Without changing the compass, repeat from point B.

Geometry and Measure – Loci

1	The locus of points **closer to B than A**,	Create a **perpendicular bisector** between A and B and shade the side closer to B.
2	The locus of points **equidistant from A**	Use a compass to draw a **circle** around centre A
3	The locus of points **equidistant to line X and line Y**,	Create an **angle bisector**
4	The locus of points a set **distance from a line**,	Create **two semi-circles** at either end joined by **two parallel lines**.

Algebra – Co-ordinates and Graphs

1	Finding the gradient	$\frac{\textbf{Change in } y}{\textbf{Change in } x}$
2	Finding the Equation of a Line <u>given a point and a gradient</u>	**Substitute** in the **gradient (m)** and **point (x,y)** in to the equation $y = mx + c$ and **solve for c**.
3	7. Finding the Equation of a Line <u>given two points</u>	Use the two points to **calculate the gradient**. Then **repeat the method above** using the gradient and either of the points.
4	Parallel Lines	If two lines are **parallel**, they will have the **same gradient**. The value of m will be the same for both lines.

Key Vocabulary

1	Equation	A statement showing that **two expressions are equal i.e 2y-17=15**
2	Quadratic	A quadratic expression is of the form: $ax^2 + bx + c$
3	Vertex	A corner or a point where two lines meet.
4	Equidistant	A point is equidistant from a set of objects if the **distances between that point and each of the objects is the same**.
5	Congruent Shapes	Shapes are congruent if they are **identical** - **same shape** and **same size**.
6	Gradient	The gradient of a line is how **steep** it is.

Ratio, Proportion and rates of change - Similarity

1	Scale Factor	To find the scale factor, divide a length on one shape by the corresponding length on a similar shape

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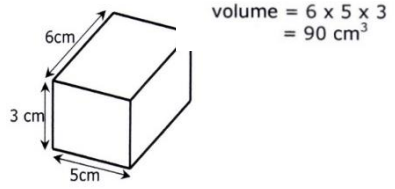
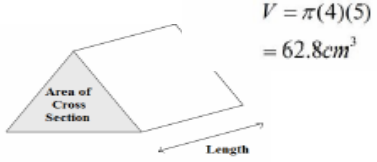
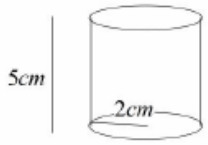
Probability

1	Theoretical Probability	$\frac{\text{Number of Favourable Outcomes}}{\text{Total Number of Possible Outcomes}}$
2	Relative Frequency	$\frac{\text{Number of Successful Trials}}{\text{Total Number of Trials}}$
3	Sample Space	The **set of all possible outcomes** of an experiment.

+	1	2	3	4	5	6
1	2	3	4	5	6	7
2	3	4	5	6	7	8
3	4	5	6	7	8	9
4	5	6	7	8	9	10
5	6	7	8	9	10	11
6	7	8	9	10	11	12

Geometry and Measure – Area, Length and Volume

1	Volume of a Cube/Cuboid V= $\boldsymbol{Length \times Width \times Height}$	 volume = 6 x 5 x 3 = 90 cm^3
2	Volume of a Prism $\boldsymbol{V = Area\ of\ Cross\ Section \times Length}$	 $V = \pi(4)(5) = 62.8cm^3$
3	6. Volume of a Cylinder $\boldsymbol{V = \pi r^2 h}$	V = $\boldsymbol{\pi x\ 2^2 x\ 5}$ = 62.8 cm^3 

Number – Indices and Standard Form

1	Square Number 1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144, 169, 196, 225…	The number you get when you **multiply a number by itself**.
2	Square Root $\sqrt{36} = 6$	The **number you multiply by itself** to get another number (The reverse process to squaring a number)
3	Cube Number 1, 8, 27, 64, 125…	The number you get when you **multiply a number by itself and itself again**.
	Cube Root $\sqrt[3]{125} = 5$	The **number you multiply by itself and itself again** to get another number. The reverse process of cubing a number.
4	Multiplying with Standard Form $(1.2 \times 10^3) \times (4 \times 10^6) = 8.8 \times 10^9$	**Multiply the numbers** and **add the powers**.
5	Dividing with Standard Form $(4.5 \times 10^5) \div (3 \times 10^2) = 1.5 \times 10^3$	**Divide the numbers** and **subtract the powers**.
6	Adding or subtracting with Standard Form $2.7 \times 10^4 + 4.6 \times 10^3$ $= 27000 + 4600$ $= 31600$	**Convert** in to **ordinary** numbers, **calculate** and then **convert back** in to standard form

Key Vocabulary

1	Formulae	Show the relationship between two or more variables
2	Substitution	Replace letters with numbers.
3	Inverse	Opposite
4	Volume	The amount of space inside a solid shape.
5	Surface Area	The total area on the surface (faces) of a three-dimensional shape
6	Prism	A prism is a 3D shape whose **cross section is the same** throughout.
7	Standard Form	$\boldsymbol{A \times 10^b}$ $\boldsymbol{where\ 1 \leq A < 10,\ b = integer\ (whole\ number)}$
8	Mutually Exclusive	Events are mutually exclusive if they **cannot happen at the same time**.

Algebra - Formulae

1	Writing Formulae (Derive) **Substitute letters for words** in the question.	Bob charges £3 per window and a £5 call out charge. $C = 3N + 5$ Where N=number of windows and C=cost

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Subject: Maths	Term: Half Term 5 - February	Year Group: 10F

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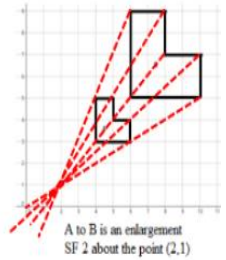
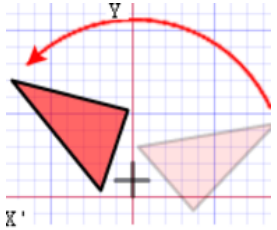
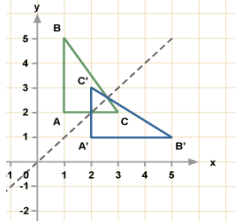
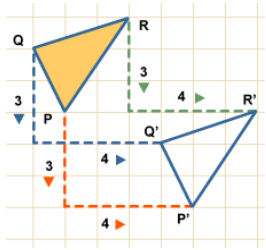
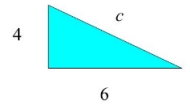
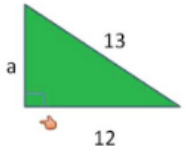
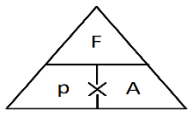
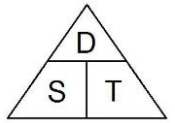
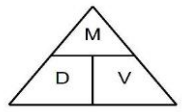
Geometry and Measures - Transformations

1	Finding the centre of **Enlargement** - Draw **straight lines** through **corresponding corners** of the two shapes.The centre of enlargement is the point **where all the lines cross over**.	
2	**Rotation** - The size does not change, but the **shape is turned around a point**.	Rotate Shape A 90° anti-clockwise about (0,1) 
3	**Reflection** - The size does not change, but the shape is '**flipped**' like in a **mirror**.	Reflect shape C in the line $y = x$ 
4	**Translate** means to **move a shape**. The shape does not change **size** or **orientation**	

Geometry - Pythagoras

1	Find the hypotenuse 	Find c. $a^2 + b^2 = c^2$ $4^2 + 6^2 = c^2$ $c^2 = 52$ $c = \sqrt{52}$ $c = 7.21$
2	Find the shorter side 	$c^2 = a^2 + b^2$ $a^2 = c^2 - b^2$ $a = \sqrt{c^2 - b^2}$ $a = \sqrt{13^2 - 12^2}$ $a = \sqrt{169 - 144}$ $a = \sqrt{25}$ $a = 5$

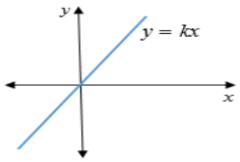
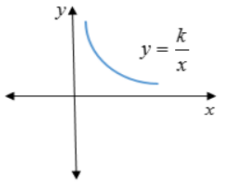
Geometry - Measures

1	**Pressure = Force ÷ Area**	
2	**Speed = Distance ÷ Time**	
3	**Density = Mass ÷ Volume**	

Key Vocabulary

1	Ratio	Ratio compares the size of **one part** to **another part**.
2	Right angle	Angles that are exactly 90°.
3	Estimate	To find something **close to the correct answer**.
4	Standard Form	$A \times 10^b$ $where\ 1 \leq A < 10,\ b = integer$
5	Similar	Shapes are similar if they are the **same shape but different sizes**.

Ratio, Proportion and rates of change - Proportion

1	Direct proportion - If two quantities are in direct proportion, **as one increases**, the **other increases** by the **same percentage**.	
2	Inverse proportion - If two quantities are inversely proportional, **as one increases**, the **other decreases** by the **same percentage**.	

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Subject: Maths	Term: Half Term 6 - April	Year Group: 10F

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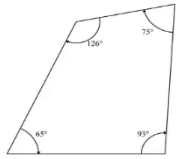
Geometry and Measures – Properties of Polygons

1	Sum of **Interior** Angles.	$(n-2)\times 180$ where n is the number of sides.
2	Size of **Exterior** Angle in a Regular Polygon.	$\frac{360}{n}$
3	Angles in a **quadrilateral** add up to 360°.	e.g 

Algebra – Simultaneous Equations

1	**Simultaneous Equations** - A set of **two or more equations**, each involving **two or more variables** (letters).	$2x+y=7$ $3x-y=8$ $x=3$

Algebra - Quadratics

1	**Expanding** brackets – When multiplying two brackets.	Use **FOIL** $(y+3)(y-2)$ $=y^2-2y+3y-6$ $=y^2+y-6$
2	**Factorising** Quadratics - When a quadratic expression is in the form x^2+bx+c find the two numbers that **add to give b** and **multiply to give c**.	$x^2+7x+10$ $=(x+5)(x+2)$ (because 5 and 2 add to give 7 and multiply to give 10)

Geometry and Measures - Vectors

1	The **resultant** vector is the vector that results from **adding** two or more vectors together.	if $\underline{a}=\begin{pmatrix}4\\4\end{pmatrix}$ and $\underline{b}=\begin{pmatrix}2\\-2\end{pmatrix}$ then $\underline{a}+\underline{b}=\begin{pmatrix}4\\4\end{pmatrix}+\begin{pmatrix}2\\-2\end{pmatrix}=\begin{pmatrix}6\\2\end{pmatrix}$
2	A **scalar** is the **number** we **multiply** a vector by.	Example: 3a + 2b = $=3\begin{pmatrix}2\\1\end{pmatrix}+2\begin{pmatrix}4\\-1\end{pmatrix}$ $=\begin{pmatrix}6\\3\end{pmatrix}+\begin{pmatrix}8\\-2\end{pmatrix}$ $=\begin{pmatrix}14\\1\end{pmatrix}$

Key Vocabulary

1	Quadratics	A quadratic expression is of the form $ax^2+bx+c,\ a\neq 0$
2	Vector	A **vector** is a quantity represented by an arrow with both **direction** and **magnitude.**
3	Substitute	$a=3, b=2$ *and* $c=5$. Find: 1. $2a=2\times 3=6$ 2. $3a-2b=3\times 3-2\times 2=5$ 3. $7b^2-5=7\times 2^2-5=23$
4	Interior	Sum of the interior angles ÷ number of sides.
5	Exterior	If the side of a polygon is extended, the angle formed outside the polygon is the exterior angle.
6	Regular	If the angles are all equal and all the sides are of equal length.
7	Polygon	Is a 2D shape with at least 3 straight sides.