Year 10F Maths Knowledge Map – Autumn Term (September-December).

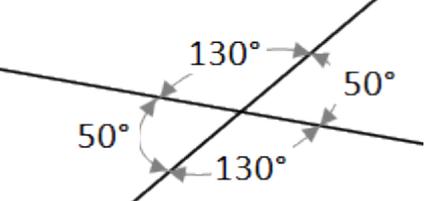| Key Word	Definition	Example
Factor	*An integer that is a divisor of another integer, when divided it gives a whole number.*	2 and 3 are factors of 6, because 2 × 3 = 6
Highest Common Factor	*(HCF) is where 2 or more whole numbers share a group of factors, and the shared factor with the highest value is the Highest Common Factor.*	12 and 30 • The factors of 12 are: 1, 2, 3, 4, 6 and 12 • The factors of 30 are: 1, 2, 3, 5, 6, 10, 15 and 30 So the common factors of 12 and 30 are: 1, 2, 3 and 6 The highest common factor is therefore 6.
Multiple	*The answer when two or more numbers are multiplied together.*	8 is the product of 4 and 2.
Lowest Common Multiple	*The smallest positive number that is a multiple of two or more numbers.*	The Lowest Common Multiple of 3 and 5 is 15, because 15 is a multiple of 3 and also a multiple of 5. Other common multiples include 30 and 45, etc, but they are not the smallest
Prime Number	*A Prime Number can be divided evenly only by 1, or itself.* *And it must be a whole number greater than 1.*	5 can only be divided evenly by 1 or 5, so it is a prime number. But 6 can be divided evenly by 1, 2, 3 and 6 so it is NOT a prime number (it is a composite number).
Indices/Powers	*The index of a number says how many times to use the number in a multiplication to multiply by itself.* *It is written as a small number to the right and above the base number.*	$8^2 = 8 × 8 = 64$
Roots	*The root of a number is a value that, when multiplied by itself by the given number above the tick of the root sign, gives the number inside of the root.*	4 × 4 = 16, so a square root of 16 is 4. Note that (−4) × (−4) = 16 too, so −4 is also a square root of 16.
Integer	*An integer (from the Latin integer meaning "whole") is a number that can be written without a fractional component.*	21, 4, 0, and −2048 are integers, while 9.75, 5 1⁄2, and √2 are not.
Metric	*A British system of measuring based on:*	A kilometer is 1,000 meters

	· The meter for length. · The kilogram for mass. · The second for time.	A centimeter is 1/100th (one-hundredth) of a meter A cubic meter is the volume of a cube whose sides are 1 meter long A litre is 1/1,000th (one-thousandth) of a cubic meter A tonne is 1,000 kilograms
Imperial	A British/American system for measuring.	Length: inches, feet, yards Area: square feet, acres Weight: pounds, ounces, Volume: fluid ounces, gallons The Imperial System has been replaced by the Metric System in most countries (including England).
Scale Factor	A number associated with an enlargement by multiplying. Usually from one shape to another.	A triangle (L) with sides of 3cm, and a triangle (P) of sides of 6cm. There is a scale factor of 2 going from 'L' to 'P'.
Net	A pattern of simple shapes joined together at the edges, when folded make a model of a 3d shape.	
Isometric	Isometric drawings are 3D drawings. They show three sides, all in dimensional proportion, but none are shown as a true shape with 90 degree corners. All the vertical lines are drawn vertically but all horizontal lines are drawn at 30 degrees to the base line. Isometric is an easy method of drawing 3D images.	
Elevation, &, Plan	2D drawings to show what a 3d shape will look like from each side. These drawings are called plans and elevations. The view from the top is called the plan. The view from the front, back and sides are called elevations (front elevation and side elevation).	
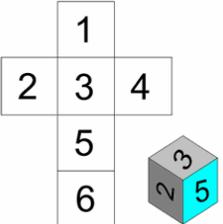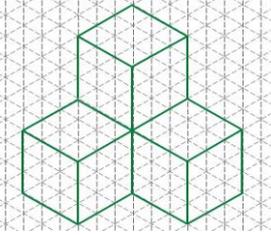
Area	*The size of a surface, measured by the amount of space inside the boundary of a flat (2-dimensional) shape.*	These shapes all have the same area of 9.
Surface Area	*The total area of all of surfaces of a three-dimensional object added together.*	The surface area of a cuboid is the combined area of all 6 faces added together.
Cross Section	*The shape made when a 3d shape is cut through parallel to the base, and at any point cut gives the same 2d shape with the same dimensions throughout.*	
Volume	*The amount of 3-dimensional space an object occupies. Capacity.*	For this example the volume is: 4×5×10 = 200 units3
Frequency	*How often something occurs/happens (usually during a given period of time).*	Your heart rate has a frequency: beats per minute (bpm).
Correlation/ Trend	*Correlation is any of a broad class of statistical relationships involving dependence, though in common usage it most often refers to the extent to which two variables have a linear relationship with each other.*	
Mode	*The number which is most occurring in a set of numbers/data.*	In {6, 3, 9, 6, 6, 5, 9, 3} the Mode is 6 (it occurs most often).
Median	*The middle number (in an ascending list of numbers).*	Find the Median of {13, 23, 11, 16, 15, 10, 26}. Put them in order: {10, 11, 13, 15, 16, 23, 26} The middle number is 15, so the median is 15. (If there are two middle numbers, you average them.)
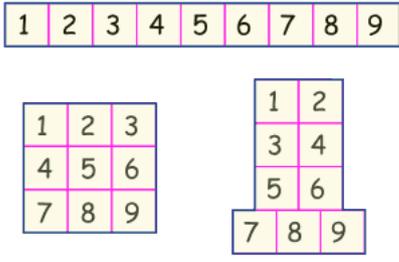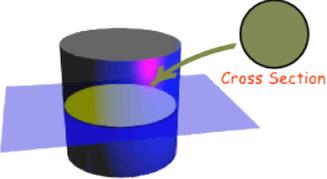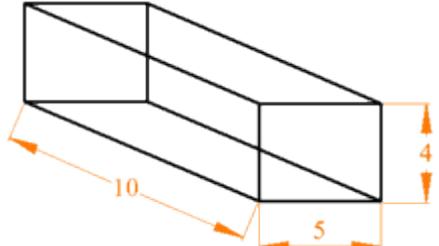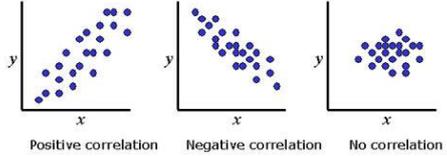
Mean	*The mean is the average of a set of numbers: a calculated single "measurable" value for a set of numbers.* *To calculate: Just add up all the numbers, then divide by how many numbers there are.*	To find the mean of: 2, 7, 9 Add the numbers: 2 + 7 + 9 = 18 Divide by how many numbers (i.e. we added 3 numbers): 18 ÷ 3 = 6 So the Mean is 6.
Range	*The difference between the lowest and highest values in a set of data.*	In {4, 6, 9, 3, 7} the lowest value is 3, and the highest is 9, so the range is 9 − 3 = 6.
Sum of Angles on a Straight Line	*Angles on one side of a straight line will always add to 180 degrees.*	
Sum of interior/exterior angles in a polygon	*Sum of Interior Angles = (n-2) × 180°* *Each Interior Angle (of a Regular Polygon):* *= (n-2) × 180° / n* *Sum of Exterior angles of any polygon = 360°* *Each Exterior angle = 360° / n* *Where n = the number of sides.*	
Sum of angles around a point	*Angles around a point will always add up to 360 degrees.*	
Angles in Parallel lines	*Two lines on a plane that never meet are parallel. They are always the same distance apart.* *Parallel lines have special properties when combined with bisecting lines that create angles.*	
Vertically opposite	*Vertically Opposite Angles are the angles opposite each other when two lines cross. "Vertical" in this case means they share the same Vertex (or corner point), not the usual meaning of up-down.*	
Corresponding	*The angles which occupy the same relative position at each intersection where a straight line crosses two others. If the two lines are parallel, the corresponding angles are equal.*	
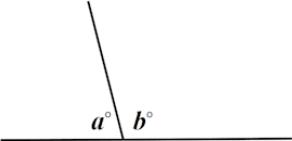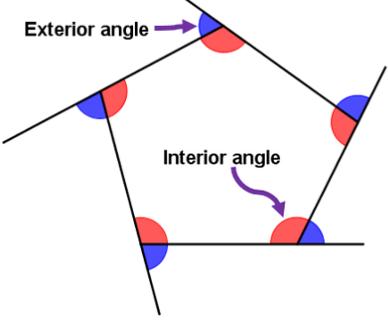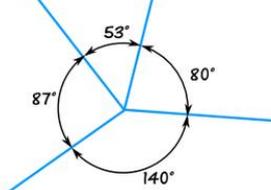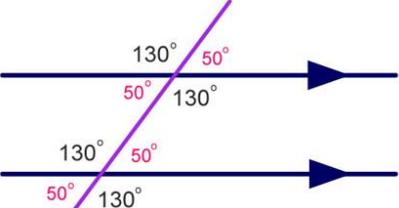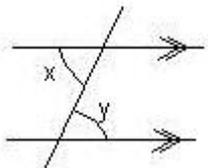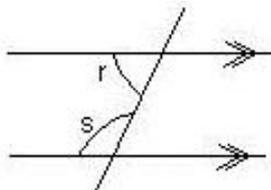
Alternate	Two angles, formed when a line crosses two other lines, that lie on opposite sides of the transversal line and on opposite relative sides of the other lines. If the two lines crossed are parallel, the alternate angles are equal.	
Co-interior	When two lines are cut by a third line (transversal) co-interior angles are between the pair of lines on the same side of the transversal. If the lines are parallel the co-interior angles are supplementary (add up to 180 degrees).	
Bearings	A bearing is an angle, measured clockwise from the north direction. On the right, the bearing of B from A is 025 degrees (note 3 figures are always given). The bearing of A from B is 205 degrees. A, B and C are three ships.	