Stage 6 Knowledge Organiser (Corbett Maths video numbers in brackets)

1. Identify common factors of two or more numbers (219)
2. Identify common multiples of two or more numbers (218)
3. Fully simplify a given fraction (146)
4. Adding and subtracting fractions with different denominators (133)
5. Solve one step algebraic equations (110)
6. Find a fraction of an amount (137)
7. Find a percentage of an amount (234, 235)
8. Find the missing term in a sequence (287)
9. Calculate the area of rectangles, triangles and parallelograms (45, 44, 49)
10. Calculate the volume of cubes and cuboids (355)
11. Solve a recipe problem (256)
12. Draw an enlargement (no centre) (104)
13. Use a two-step formula
14. Use a protractor to draw and measure angles (<180) (28, 31)
15. Angles in triangles and quadrilaterals (33, 37)
16. Construct a pie chart (163)
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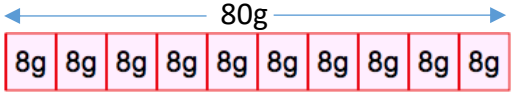
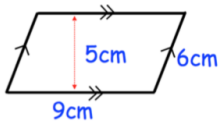
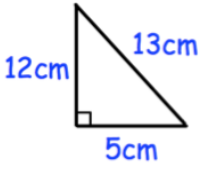
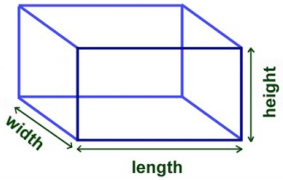
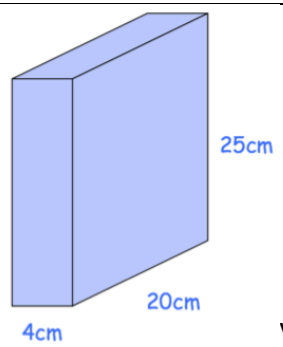
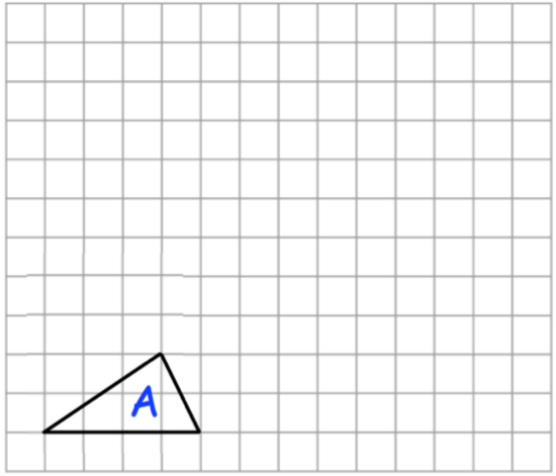
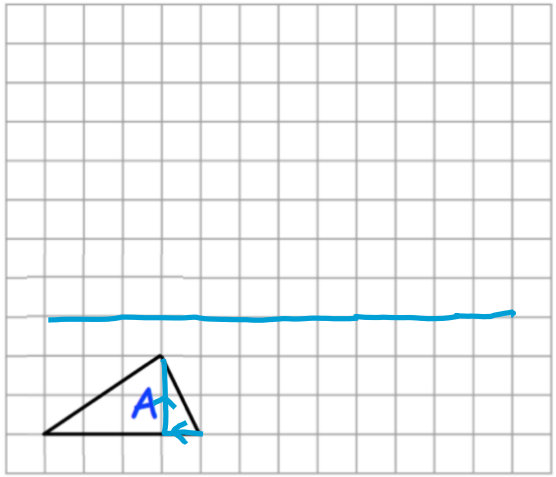
18. Calculate the mean of a list of numbers (53)
19. Plot coordinates in all 4 quadrants (84)
20. Translate a shape by a worded vector (325)

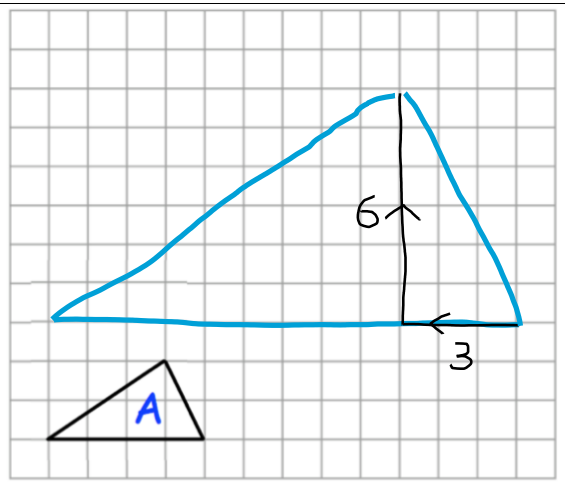
Skill	Method	Keywords/Definitions
601	Identifying Common Factors List the factors of both number and find any factors that appear in both lists Example: Find the common factors of 12 and 20 Factors of 12 Factors of 20 1x12 1x20 2x6 2x10 3x4 4x5 So, the common factors of 12 and 20 are 1, 2 and 4	Factors of a number can divide equally into that number. Common factors are factors of one or more numbers.
602	Identifying Common Multiples List the multiples of each number and find ones that appear in both lists Example: Find a common multiple of 6 and 9 Multiples of 6 include: 6, 12, 18, 24, 30 Multiples of 9 include: 9, 18, 27, 36, 45 So, 18 is a common multiple of both 6 and 9	Multiples of a number are found by multiplying that number by a whole number (their times tables)
603	Fully Simplify a Given Fraction Divide both the numerator and denominator by the same thing until you cannot find any more numbers that both can be divided by. Example: Simplify $\frac{36}{42}$ 2 is a factor of both 36 and 42 so we can divide both numbers by 2 which gives us $\frac{18}{21}$ 3 is a factor of both 18 and 21 so we can divide both numbers by 3 which gives $\frac{6}{7}$ There are no more common factors so $\frac{6}{7}$ is simplified fully.	Equivalent fraction: where the same fraction can be show using different numbers than the ones given
604	Adding, Subtracting, Multiplying and Dividing Fractions For adding and subtracting use equivalent fractions to get both fractions to have the same denominator then add/subtract numerators. Example: Calculate $\frac{6}{7}-\frac{3}{5}$ Multiply the $\frac{6}{7}$ by $\frac{5}{5}$ and the $\frac{3}{5}$ by $\frac{7}{7}$ which gives $\frac{30}{35}-\frac{21}{35}$ (this is known as cross multiplication) Now the denominators are equal we can subtract numerators to give $\frac{9}{35}$ Use the exact same method for an addition, just add the numerators at the end instead of subtracting them. For multiplying fractions multiply the numerators together and multiply the denominators together. Example: Calculate $\frac{2}{7}\times\frac{3}{8}=\frac{6}{56}$ which simplifies to $\frac{3}{28}$	Numerator- top number Denominator-bottom number Equivalent fraction- the same fraction written with different numbers

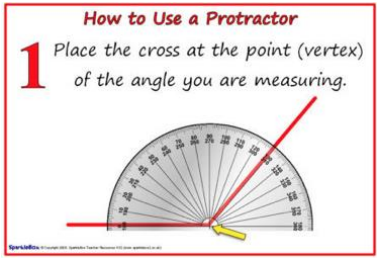
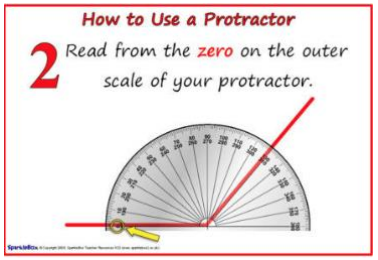
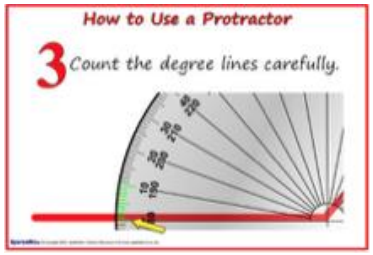
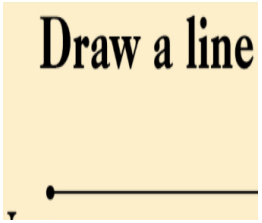
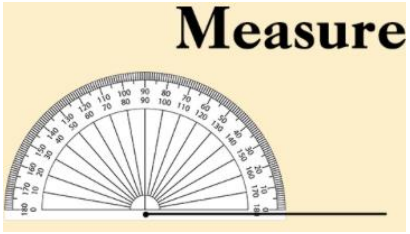
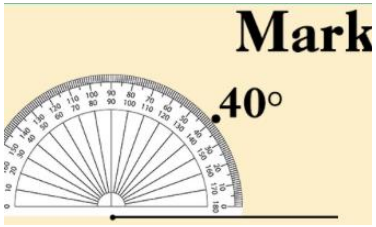
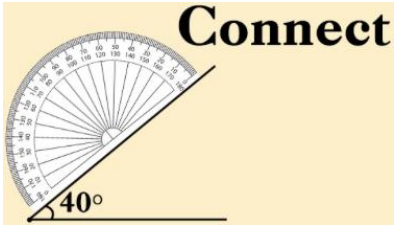
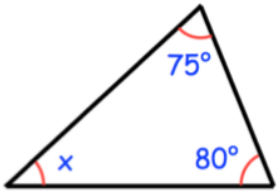
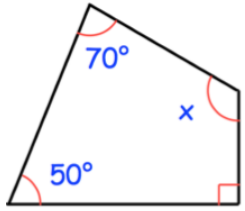
	For dividing fractions flip the second fraction only upside down and multiply this fraction by the first fraction. Example: Calculate $\frac{3}{4} \div \frac{5}{6}$ turn the second fraction upside down and multiply the three quarters by this new fraction $\frac{3}{4} \times \frac{6}{5} = \frac{18}{20}$ then this simplifies to $\frac{9}{10}$	
605	Solve one step algebraic equations Use the inverse operation t find the value of the letter, remembering that whatever you do to one side of an equation you must do to the other to keep it balanced. Example: solve $x - 7 = 12$ Get rid of the -7 here by using the inverse operation: +7 on both sides +7 +7 this 'deletes' the -7 on the left hand side but adds 7 onto the 12 on the right hand side $x = 12$ Remember that terms like $5x$ mean '*5 multiplied by x*', and. $\frac{x}{6}$ means *'x divided by 6'*	Equations have letters numbers AND an equals sign. Inverse means opposite: so add and subtract are inverse and multiply and divide are inverse.
606	Find a Fraction of an Amount: Draw a diagram to represent the fraction you want to find. Use the amount given to find what's in each block, then count up the blocks you have shaded. Example: Find $\frac{3}{7}$ of £210  this diagram represents the $\frac{3}{7}$ as 3 out of the 7 blocks are shaded.  so if the whole diagram represents the £210, we can divide the £210 into the 7 blocks  and count up the blocks we shaded: £30 + £30 + £30 = £90 So, $\frac{3}{7}$ of £210 is £90	
607	Finding a Percentage of an Amount: Find 10% (and 5% if needed) then use these to find the percentage you want. Example: Find 35% of 80g  Each block here represents 10% = 8g and from this we can find the 5%=4g	Percent means 'out of 100' To find 10% divide by 10

	10%=8g 10%=8g 10%=8g <u>+ 5% = 4g</u> 35%=28g So 35% of 80g = 28g	
608	Finding a missing term in a sequence Decide what the rule is for the sequence then use this to find the missing term. Example: Find the next term in the following sequence 3 8 13 18 23 The rule here must be +5 so the next term is 23 + 5 = 28	A sequence is a pattern of numbers following a rule
609	Finding the area of rectangles, parallelograms and triangles. For a rectangle and parallelogram area = length x width  Area= 12cm x 2cm = 24cm^2  Area = 9cm x 5cm = 45cm^2 Note that the 6cm is NOT the height For a triangle area = base x height ÷ 2 (a triangle is effectively a rectangle cut in half)  Area = 5cm x 12cm ÷ 2 = 30cm^2 again note that the 12cm is the height here, NOT the 13cm	Height must be straight up in shapes, not slanty! Units for area should always be squared m^2 cm^2 mm^2 etc
610	Finding the volume of cubes and cuboids  Multiply the length, width and height together (these will all be the same for a cube) Example: Find the volume of the following cuboid	Length, width and height can be replaced with different names for example base, height, depth etc Units here should all be cubed to show it is a 3D space cm^3 m^3 etc

	 Volume = 4cm x 20cm x 25cm = 2 000cm^3	
611	Solve a Recipe Problem Recipes work using direct proportion (if one thing doubles, everything else needs to double etc) Example: Below are the measurements to make 8 scones. How much of each ingredient would be needed to make 20 scones? **8 Scones** 200g flour 30g caster sugar 50g butter 140ml milk 1 egg IF we double everything here we get 16 scones, if we treble (x3) we get 24, so we cant just do that but 16+4=20 so find the measurements for 16 and the measurements for 4 and add these to get the measurements for 20. **8 Scones** 16 4 20 200g flour 400 100 500 30g caster sugar 60 15 75 50g butter 100 25 125 140ml milk 280 70 350 1 egg 2 ½ 2½	
612	Draw an Enlargement Us the scale factor of enlargement to decide how bog each of the new, enlarged sides of the shape needs to be.	Scale factor – what each side length

	Example: On the grid draw an enlargement of the triangle using scale factor 3  As we have a scale factor of 3, the base wil go from being 4 units across to 12 units across  To enlarge the right hand diagonal side we need to count squares. It goes 1 square left and 2 squares up, so when it is enlarged it will need to go 3 squares left and 6 squares up	needs to be multiplied

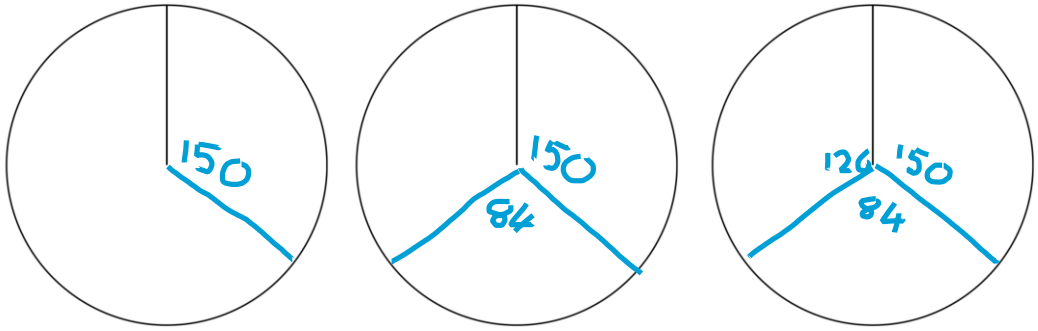
	 As this gives us the top point on the triangle we can join it up to the base to complete the enlargement.	
613	Use a Two Step Worded Formula A formula is a set of instructions to do to an 'input' number that will give you a corresponding 'output' number. A two-step formula has two operations to do to the input to find the output. Example: To convert between degrees Celcius and degrees Farneheit you can use the basic formula: $$Temperature\ \ in\ Farenheit = Temperature\ in\ Degrees\ \times 2 + 32$$ Calculate the Farenheit temperature when it is 24° Celcius If we know that the 'temperature in degrees' is 24 then we can put that into our formula: $$Temperature\ \ in\ Farenheit = 24\ \times 2 + 32$$ Using BIDMAS to calculate this gives us 48 + 32 = 80°F We can also be given the 'output' and asked to find the 'input' Example: Using the same temperature formula above, if the temperature is given as 92° Farenheit, what is the temperature in degrees celcius? This time replace the 'temperature in Farenheit' with 92 to give $$92 = Temperature\ in\ Degrees\ \times 2 + 32$$ So we now need to solve this using inverse operations. So we subtract 32 and then divide by two (remember to do the opposite order to BIDMAS when using inverse operations) 92 – 32 = 60 ÷ 2 = 30°C	A Formula is a set of instructions to get from an input to an output. They can also be algebraic, and you know some formulae already like: Area=Length x Width Degrees Celcius and Degress Farenheit are two measures of temperature. In the UK we normally use Celcius.

614	Using a Protractor to Measure and Draw Angles Measuring an Angle:    Its always a good idea to decide if your angle is acute or obtuse before measuring so you can see if your answer makes sense. For example in the diagrams above, would an answer of 58° make sense? Drawing an angle  Draw a straight line  Put the centre of the protractor On where you want to draw the Angle from  Counting from the zero on the side of your line, mark the angle you want  Connect the mark to the end of your line to form the angle Check that you have drawn the right type of angle once drawn (acute or obtuse)	A protractor is a semi-circular piece of equipment we use to measure and draw angles. Acute angle – less than 90 Obtuse angle = between 90 and 180
615	Use the Angle Facts Angles in Triangles and Angles in Quadrilaterals Rule: Angles in triangles always add up to 180° Example: Find angle x  Add up the angles that we know: Rule: Angles in quadrilaterals always add up to 360° Example: find angle x 	Quadrilateral – a shape with 4 sides. There are lots of different types of quadrilaterals that we come across in maths.

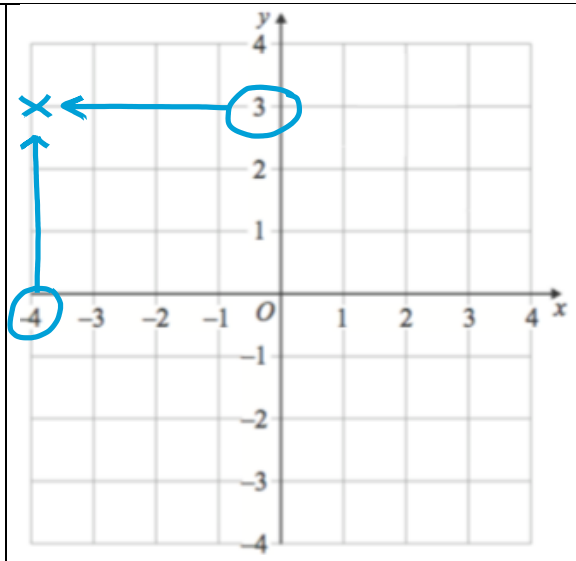
	$75 + 80 = 155$ $70 + 50 + 90 = 210$ remember the little box means 90° So to find the missing one, subtract this from the total we know from the rule $180 - 155 = 25$ $360 - 210 = 150$	
616	Construct a Pie Chart Example: construct a pie chart from the frequency table below Add up your frequencies to find the total $25 + 14 + 21 = 60$ What we now need to decide is what number links our total frequency (60) to the total for the degrees in a pie chart (this is ALWAYS 360 as a pie chart is always in the shape of a circle) So we divide $360 \div 60 = 6$ This means to find the angle we need to draw for each colour we must multiply the frequency by 6 each time Draw on the angles to your circle accurately using a protractor, making sure to move around the circle after you've drawn each one so you don't overlap the sections.	

Colour	Frequency
Blue	25
Green	14
Red	21

Colour	Frequency	
Blue	25	× 6 = 150
Green	14	× 6 = 84
Red	21	× 6 = 126



617	Round to the Nearest 10, 100 and 1000 Rounding a number means giving it as the closest 10, 100 or 1000. To decide which one it is closest to, decide the two it lies in between then use the rule "5 or more go up, otherwise go down" Examples: Round 47 to the nearest 10 47 lies between 40 and 50. As it is over 45 we round up to 50 Round 729 to the nearest 100. 729 lies between 700 and 800. As we are rounding to the nearest 100, it is the digit in the tens column that we look at to decide whether to go up or down. The tens has a 2 in it this time so we round down to 700 Round 12 503 to the nearest 1000 In terms of 1000, we 503 lies between 12 000 and 13 000. As we are rounding to 1000 it will be the hundreds column that we look at to decide whether to round up or down. This time the hundreds has a 5 in it so we round up to 13 000	
618	Calculate the Mean of a List of Numbers The mean is a type of average. An average is a typical or normal value for a group. $mean = \frac{total}{count}$ Where the total is the numbers added up and the count is how many numbers there are. Example: Find the mean of the following numbers 13, 6, 10, 6, 4, 8, 17, 9 Total = $13 + 6 + 10 + 6 + 4 + 8 + 17 + 9 = 73$ the count here is 8 as there are 8 numbers So, $mean = \frac{73}{8} = 9.125$	
619	Plot Coordinates in all 4 Quadrants A coordinate is made up of two numbers in a bracket, separated by a comma. They show us a specific place on a grid of numbers. The first number lines up with the x axis (going across) and the second numbers lines up on the y axis (going up and down. Example: Plot the following coordinate on a grid (-4, 3)	

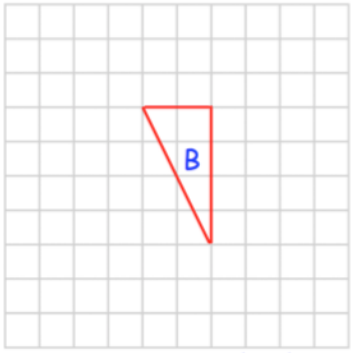


Line the -4 up on the x axis and the 3 up on the y axis and the combination of these two give us our coordinate.

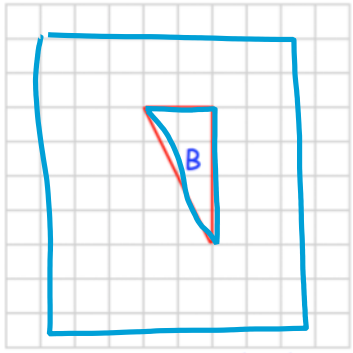
620 Translate a Shape by a Worded Vector

A vector has both size and direction. So, if I tell you to move 3 squares left and 2 down, that is a vector as it tells you which direction to move in and how far to move.

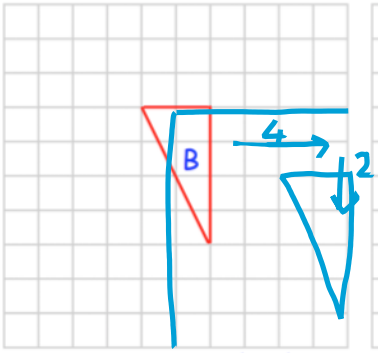
Example: Translate the triangle B 4 squares right and 2 squares down



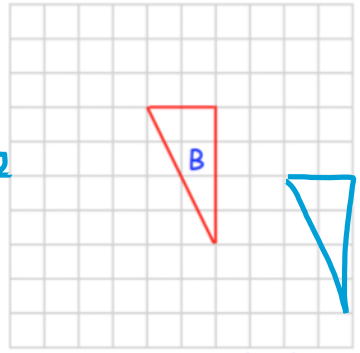
Trace the shape



Move the tracing paper so The shape moves 4 right Then two down



Mark on the corners of the position of the new shape



Remove the tracing paper and draw in the new shape.