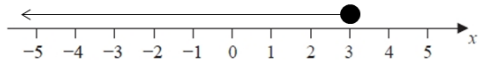
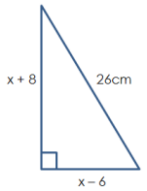
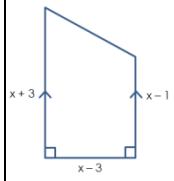
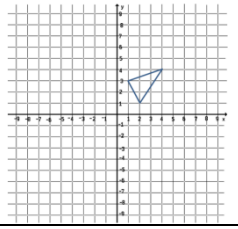
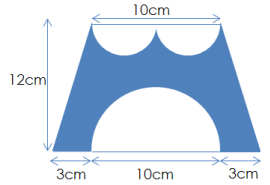
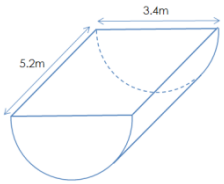
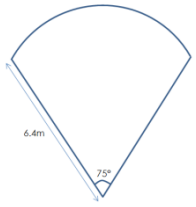
A BIT OF MATHS EACH DAY – HIGHER TIER – SEPTEMBER 2017

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
				1st	2nd	3rd
September **Calculator**		The best way to learn mathematics is to DO mathematics. If you do something regularly on a daily basis you will make a bigger difference than leaving it till just before your exams. If you need help there are some fantastic videos at www.corbettmaths.com Or you can always tweet me **@mrchadburn**		Pauline invests £5000 in a bank which pays 2.1% compound interest. How much will Pauline have in her account if she doesn't touch her original investment after 4 years?	 (a) Write down the inequality shown by the number line (b) Solve the inequality $4x - 2 > 2x - 7$ (c) Write down all the integer values which satisfy BOTH the inequalities in parts (a) and (b)	
4th	5th	6th	7th	8th	9th	10th
Make m the subject of the formula $r = \frac{3m^2 - 5}{n}$	 Find the value of x	 The area of this trapezium is 77cm². What is the perimeter of the trapezium?	Y is proportional to the cube of X. When Y = 576, X = 4. (a) Write down an equation connecting X and Y. (b) If Y = 30.375 what would X be?	Solve the equations (a) $5(3x - 2) = 2x + 3$ (b) $7x^2 - 13 = 99$ (c) $x^2 + 9x - 36 = 0$		Enlarge the triangle with a scale factor of -2.5 using (1, 1) as the centre of enlargement.
11th	12th	13th	14th	15th	16th	17th
Solve the equation $6x^2 - 4x = 5$ giving your answers correct to 2 decimal places.	Without the use of a calculator, work out the answer to: (a) $5\frac{2}{3} - 2\frac{3}{4}$ (b) $2\frac{2}{5} \div 1\frac{2}{9}$ Give your answers as mixed numbers.	(a) Write 0.000907 in standard form (b) Write 5.821×10^3 as a normal number (c) Evaluate $\frac{(4.1\times10^{-2})\times(3.8\times10^{4})}{9.11\times10^{-2}}$ giving your final answer correct to 3 significant figures.	A function is of the form $y = ab^x$. The coordinates (1, 12) and (5, 972) satisfy the function. Find the value of y when x = -1. Give your answer in exact form.	A cuboid has its length increased by 30%, its width decreased by 10% and its height decreased by 20%. What is the overall effect on the volume of the cuboid?		The diagram shows a trapezium with semicircles removed. Find the area of the shaded region giving your answer correct to 4 significant figures.
18th	19th	20th	21st	22nd	23rd	24th
Solve the simultaneous equations $5x - 3y = 26$ $3x + 4y = 4$	The population of Pitsborough has increased by 8% in the last 5 years to 18,576. The population of Bramallville has increased by 15% in the last 5 years to 18,975. Compare the changes in population over the last 5 years between Pitsborough and Bramallville.	Prove that $(3n + 5)^2 - (3n - 5)^2$ is always a multiple of 6 for all positive integer values of n.	The algebraic fraction $\frac{ax^2 + bx + c}{dx^2 - 4}$ simplifies to $\frac{x+7}{3x-2}$. Find the integers a, b, c and d.	A rectangle and an equilateral triangle have the same perimeter. The longest side of the rectangle is 5cm longer than the shortest side. The side of the equilateral triangle is double the shortest side of the rectangle. Find the area of the rectangle.		The diagram shows a semi-circular prism shaped water container. Water is poured into the container at a rate of 10 litres per minute. Water stops pouring when it has reached 90% of its capacity. How long will it take to reach 90% of its capacity? Give your answer in hours and minutes. ($1m^3$ = 1000 litres)
25th	26th	27th	28th	29th	30th	1st October
Annette is going to Mexico on holiday. The exchange rate is £1 = 22 pesos. She changes up to £400 into pesos but wants only 50 peso notes. (a) How many 50 peso notes can she get for £400? She returns with 1105 pesos. She can exchange pesos back to pounds at the rate of £1 = 19.5 pesos. How many pounds will she receive back?	Line L_1 and L_2 are perpendicular to each other. The equation of L_1 is $y = 2x + 7$. Line L_2 goes through the point (4, 3). What is the equation of line L_2 ?	m is inversely proportional to the square root of n. When m = 0.8, n = 100. What will m n be when m = 40?	(a) What is the reciprocal of 6.25? (b) Evaluate $\frac{12.2-\sqrt{33.6}}{\sqrt{42}-4.1}$ giving your answer correct to 3 significant figures.	The graphs of $y = x^2 + 5x - 4$ and $y = 3 - x$ meet at points A and B. Find the coordinates of A and B and hence the **exact** length of AB.		The diagram shows the plan of a garden. The garden is to be filled with gravel. A bag of gravel costs £6.99 excluding VAT and covers $2.5m^2$. There is an offer on which gives 15% off before the VAT has been added. How much will it cost to gravel the garden with the offer and after VAT at 20% has been added?