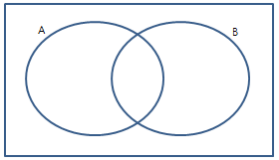
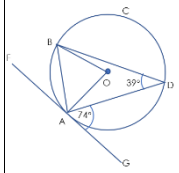
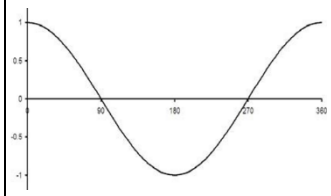
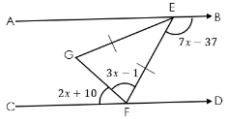
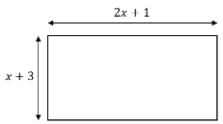
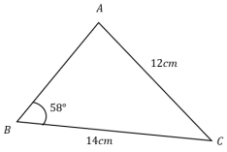
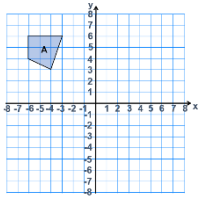
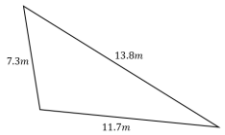
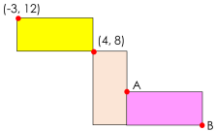
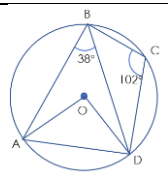
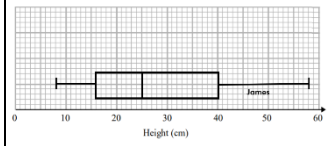
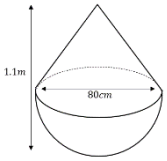
A BIT OF MATHS EACH DAY – HIGHER TIER – APRIL 2023 – CALCULATOR

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
30th					**1st**	**2nd**
Volume of cone = $\frac{1}{3}\pi r^2 h$ Volume of sphere = $\frac{4}{3}\pi r^3$	**April** **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**			ε={1,2,3,4,5,6,7,8,9,10,11,12,13,14,15} A={Factors of 56} B={Prime numbers} (a) Explain in words what i. A ∪ B and ii. A ∩ B mean (b) Complete the Venn Diagram (c) Write down the probability of i. A ∪ B and ii. A ∩ B
3rd	**4th**	**5th**	**6th**	**7th**	**8th**	**9th**
Annette is travelling to Switzerland. The exchange rate between British Pounds (£) and Swiss Francs (CHF) is £1 = 1.18CHF. She converts £840 into Swiss Francs. When in Switzerland she spends 712CHF. When she returns, the exchange rate is 1CHF = £0.90. What percentage of her original £840 has she got left after converting it back into pounds?	 Find the size of angle OBD. Give geometric reasons for each stage of your working.	Rose, Steve and Terry shared some sweets. Steve received 25% more than Rose. Rose and Terry's share was in the ratio 4 : 9. Steve received 20 sweets. How many sweets in total did the three receive?	A concrete block has width 3m and length 8m. The pressure it exerts on the ground is 250N/m². What force is it exerting? $\left(Pressure = \frac{Force}{Area}\right)$	(a) Expand and simplify fully $(3x + 7)(2x - 9)$ (b) Factorise fully $24x^3y^2 - 18x^2y$ (c) Simplify fully $\frac{3a^2 \times 8ab}{6ab^2}$	This is the graph of $y = \cos x$. Given than $\cos 60 = \frac{1}{2}$ **use the graph** to write down the value of (a) $\cos 300$ (b) $\cos 240$  Show how you have used your graph to obtain these values.	
10th	**11th**	**12th**	**13th**	**14th**	**15th**	**16th**
 Find the size of angle FEG.	Brian bought a car in 2017 for £12,500. The car depreciates at a rate of 9% per year. (a) What was its value in 2018? (b) What will its value be in 2023?	(a) $x = 8.9$ and has been rounded to 1 decimal place. What is the error interval for x? (b) $y = 300$ and has been rounded to 1 significant figure. What is the error interval for y?	 Find the range of values for x such that the area of the rectangle is less than 52cm².	 (a) Find the size of angle BAC. (b) Is this the only possible value for angle BAC? Justify your answer.		Shape A is rotated 180° about the origin and then translated using the vector $\begin{pmatrix}-3\\2\end{pmatrix}$ to become shape B. What **single transformation** takes shape B back on to shape A?
17th	**18th**	**19th**	**20th**	**21st**	**22nd**	**23rd**
A function, f is such that f(x) = 2x + 7. (a) Find f(12) (b) Find $f^{-1}(x)$ Another function, g is such that g(x) = $ax^2 + 2$. (c) Given that gf(3) = 509, find the value of a.	 Find the area of this triangle.	 The diagram shows three congruent rectangles. What are the coordinates of A and B?	 Find the size of angle OAB. Give geometric reasons for each stage of your working.	(a) Point A has co-ordinate (-3, 1). It is reflected in the y-axis. What is the new coordinate? (b) Point B has coordinate (-6, -2). It is translated by the vector $\begin{pmatrix}5\\-3\end{pmatrix}$ then reflected in the x-axis. What is the new coordinate?	James grew some tomatoes in his greenhouse. The distribution of heights of the plants are shown in the box and whisker diagram below. Julie also grew some plants. Her smallest plant was 12cm tall and the range was 43cm. 50% of her plants were larger than 35cm. 25% were smaller than 27cm and 75% were smaller than 42cm, Show this as a box and whisker diagram and compare and contrast the heights of James' and Julie's plants. 	
24th	**25th**	**26th**	**27th**	**28th**	**29th**	**30th**
Which is larger 0.8m² or 780,000mm²? Justify your answer.	Solve the equation $\frac{2x+5}{3} - \frac{1-4x}{4} = \frac{5}{8}$	Solve the inequality $x^2 + 9x \geq 36$	 The diagram shows a buoy made of a hemisphere and cone. Find the volume of the buoy.	A is directly proportional to the square of B. When A = 72, B = 3. Find the value of B when A = 2.	Coordinate A(-3, 5) lies on the graph of the function $y = f(x)$. Write down the coordinate of A after y undergoes the following transformations… (a) $y = f(x + 4)$ (b) $y = f(x) - 2$ (c) $y = 2 - f(x)$	In an attempt to estimate the number of fish in a lake, the warden captures 20 fish and tags them then releases them. Later the warden catches 30 fish and notes that 4 have tags on. Estimate the population of fish in the lake.