A BIT OF MATHS EACH DAY – FOUNDATION TIER – JANUARY 2023

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
30th	**31st**				**December 31st 2022**	**January 1st 2023**
Ann is making home-made crackers. She is putting a toy and a hat in each cracker. The toys come in packs of 12 and the hats in packs of 16. She wants to buy the same number of toys and hats. (a) how many packs of each will she buy? (b) each cracker requires 1 piece of card. How many pieces of card does she need?	A delivery company uses 240 cars and vans, which are in the ratio 5 : 7. The vehicles use diesel, petrol or electricity. 20% of the vans use diesel. $\frac{2}{7}$ of the vans use electricity. The rest use petrol. How many vans uses petrol?	**January NON-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**		(a) Draw the graph of the function y = 3x + 2 between x = -3 and x = 3. (b) Write down a **different** function of x which would be parallel to the graph you drew in part (a).	
2nd	**3rd**	**4th**	**5th**	**6th**	**7th**	**8th**
(a) Simplify $3m^3 + 2m - m^3$ (b) Factorise $2x^2 + x$ (c) Make r the subject in $p = 5r - 7$	Alex is considering three companies (X, Y and Z) to rent a car from for 20 days. Each uses a formula to work out the cost (C) in £ using the number of days (D): X: C = 27.5D Y: C = 21.2D + 120 Z: C = 23D + 80. Which company should Alex use? You must show how you came by your answer.	(a) Change 4000mm into cm (b) Change 4000mm² into cm² (c) Change 4000mm³ into cm³.	(a) The population of Bramallville is 25,000. This has been rounded to the nearest 1000. What is the **smallest** it could be? (b) Estimate the answer to $\frac{58 \times 381.2}{79.5}$ Showing how you came by your answer.	(a) Write $^{13}/_{20}$ as a percentage (b) Find 35% of £140 (c) Find $^4/_7$ of 224kg (d) Find 0.2 x 0.06		Alan left home at 12noon to go for a cycle ride. He cycled at a constant speed and stopped for a 15minute break. He then cycled at a constant speed of 10km/hr until he reached a café at 2pm. He stopped at the café for 45 minutes. He then cycled home at an average speed of 16km/hr. (a) How far had he travelled when he had his first break? (b) Complete the graph – when does he arrive home?
9th	**10th**	**11th**	**12th**	**13th**	**14th**	**15th**
(a) Write 400 as a product of prime factors (b) Write 480 as a product of prime factors (c) Hence or otherwise find the highest common factor (HCF) of 400 and 480	Find the value of x.	Solve the following equations… (a) 6x – 9 = 15 (b) 2x + 3 = 5x – 8 (c) 4(x – 3) = 2(4 – 3x)	On Monday Dawn travelled by train from Sheffield to London. She set off at 09:35 and arrived in London at 12:05. The average speed of the train was 106 mph. On Wednesday, Rachael did the same journey, setting off at 09:35. Her train was diverted via Birmingham which meant she had to travel an extra 67 miles. She arrived in London at 13:35. What is the difference in the average speed of the two train journeys?	Dianne and Dave split some money in the ratio 2 : 7, Dave received £126. How much money did they split?		(a) On the grid, translate shape P using the vector $\begin{pmatrix} -4 \\ -3 \end{pmatrix}$. Label the new shape Q. (b) On the grid, translate shape Q using the vector $\begin{pmatrix} -2 \\ 5 \end{pmatrix}$. Label the new shape R. (c) Write down the column vector that would translate P directly onto R.
16th	**17th**	**18th**	**19th**	**20th**	**21st**	**22nd**
Evaluate $4\frac{4}{7} - 2\frac{3}{8}$	James is going to cover his rectangular floor with carpet tiles. His floor measures 4.8m by 7.2m. Each tile measures 80cm by 60cm. He decides to tile with a mix of red, white and black tiles. $^3/_8$ of the tiles are to be red. White and black are in the ratio 4:5. Assuming there are no gaps, how many of each colour will he need?	ABCD is a parallelogram. Find the value of x and y.	Factorise (a) $12x^2 – 15x$ (b) $x^2 + 11x – 60$ (c) $x^2 – x – 56$	Evaluate $2\frac{1}{8} \div 3\frac{2}{5}$		In a room there are 100 people. 48 are female. 18 of the people in the room are left handed. 39 of the males are right handed. (a) Complete the frequency tree. (b) What percentage of the men are left handed? (c) What is the probability one woman picked at random is left handed?
23rd	**24th**	**25th**	**26th**	**27th**	**28th**	**29th**
(a) Expand 4f(2f + 9) (b) Expand (2x + 1)(3x – 2)	Here are the ingredients needed to make 16 gingerbread men 180g flour 40g ginger 110g butter 30g sugar Doris wants to make 40 biscuits. How much of each ingredient will she need?	Find the size of angles A and B, giving full geometric reasons for each stage of your working.	The population of the Isle of Blades has been increasing by 12% each year. In 2018 the population was 67,200. (a) What will the population be in 2019? (b) What was the population in 2017?	Eric, Ernie and Des share £300. The ratio of the amount Eric gets to the amount Des gets is 2 : 7, Des gets £120 more than Eric. What percentage of the £300 does Ernie get?		The shape on the left is made up of two rectangles. (a) **Estimate** the total area of the shape. (b) Is your answer to part (a) an under-estimate or over-estimate? Give a reason for your answer.