

A BIT OF MATHS EACH DAY – HIGHER TIER – MARCH 2018 – NON CALCULATOR

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY	
<h1 style="color: red; font-size: 2em; margin: 0;">March</h1> <h2 style="color: red; font-size: 1.5em; margin: 0;">Non-Calculator</h2>	<p>The best way to learn mathematics is to DO mathematics.</p> <p>If you do something regularly on a daily basis you will make a bigger difference than leaving it till just before your exams.</p> <p>If you need help there are some fantastic videos at www.corbettmaths.com</p> <p>Or you can always tweet me @mrchadburn</p>	<p>(a) Point A has coordinate (-3, 1). It is reflected in the y-axis. What is the new coordinate?</p> <p>(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?</p>	<p>1st</p>	<p>2nd</p>	<p>3rd</p>	<p>4th</p>	
				<p>The shape above is a parallelogram. Find the value of y.</p>		<p>Solve the pair of simultaneous equations</p> $y - 2x = 3$ $x^2 + y^2 = 18$	
<p>5th</p>	<p>6th</p>	<p>7th</p>	<p>8th</p>	<p>9th</p>	<p>10th</p>	<p>11th</p>	
<p>A wall is 8m long and 1.8m high. Paul is tiling it with tiles which measure 20cm by 18cm. The tiles are to be red, white and black. $\frac{5}{8}$ are to be red. White and black are to be in the ratio 7:8. How many of each colour will he require?</p>	<p>A shirt is sold for £37.80 in a sale. Its pre-sale price was £63. What was the percentage reduction?</p>	<p>Solve the inequality</p> $x^2 < 24 - 5x$	<p>Work out</p> <p>(a) 9.39×8.3</p> <p>(b) $107.016 \div 0.12$</p> <p>Both must be done without the use of a calculator.</p>	<p>A sequence is defined by the term to term rule</p> $U_{n+1} = 2U_n^2 - 3U_n + 1$ <p>The 2nd term, U_2 is 10.</p> <p>(a) Find U_1</p> <p>(b) Find U_3 and U_4</p>		<p>The graph illustrates the charges of a particular taxi firm where x is the miles travelled and y is the cost of the journey.</p> <p>(a) Interpret the intercept of the graph on the y-axis.</p> <p>(b) Interpret the gradient of the graph.</p> <p>(c) Write down the equation of the line in the form $y = mx + c$.</p>	
<p>12th</p>	<p>13th</p>	<p>14th</p>	<p>15th</p>	<p>16th</p>	<p>17th</p>	<p>18th</p>	
<p>(a) Expand and simplify $(3x + 2)(2x - 7)$</p> <p>(b) Solve the equation $x^2 + 2x - 80 = 0$</p>	<p>Show that $\frac{5-4\sqrt{3}}{9+2\sqrt{12}}$</p> <p>Can be written as</p> $\frac{93-56\sqrt{3}}{33}$	<p>The shape above is a pentagon. Work out its area.</p>	<p>A line is perpendicular to another line with equation $5x + 2y - 7 = 0$. It goes through the point with coordinate (3, -2). Work out the equation of the line in the form $ax + by + c = 0$ where a, b and c are integers to be found.</p>	<p>Angle BAD is 69°. Find the size of angle BOC explaining each step of your working.</p>	<p>There are red and white counters in a bag. There are 9 white counters and n red ones. Two counters are taken out (the first without replacement). The probability that both are red is $\frac{11}{38}$.</p> <p>(a) Prove that $3n^2 - 25n - 88 = 0$</p> <p>(b) Hence find the number red counters originally in the bag.</p>		
<p>19th</p>	<p>20th</p>	<p>21st</p>	<p>22nd</p>	<p>23rd</p>	<p>24th</p>	<p>25th</p>	
<p>Make m the subject of the formula</p> $\frac{m+9}{a} = \frac{m-b}{n}$	<p>Ian is travelling from Sheffield to Edinburgh. His train left Sheffield train station at 0821 and arrived in Edinburgh at 1321. The train travelled at an average speed of 50 miles per hour.</p> <p>Annette is travelling the other way but unfortunately her train is diverted via Manchester. It had to travel an extra 70 miles. She left Edinburgh at 1042 and arrived in Sheffield at 1722. What was the difference in their average speeds?</p>	<p>An equilateral triangle has side of 6cm. Find the area of the triangle, giving your answer as an exact number.</p>	<p>The point A with coordinate (8, 2) lies on the curve $y = f(x)$. Write down the coordinate of A after it undergoes the following transformations...</p> <p>(a) $y = f(x + 3)$</p> <p>(b) $y = f(x) + 4$</p> <p>(c) $y = 2f(x) - 3$</p> <p>(d) $y = f(4 - x)$</p>	<p>(a) Write 360 as a product of prime factors.</p> <p>(b) Write 420 as a product of prime factors.</p> <p>(c) Use your answers to (a) and (b) to find the Highest Common Factor (HCF) of 360 and 420.</p> <p>(d) Use your answers to (a) and (b) to find the Lowest Common Multiple (LCM) of 360 and 420.</p>		<p>P, R, T and V are the midpoints of OQ, QS, SU and OU respectively.</p> $\vec{OV} = \mathbf{a}, \vec{OP} = \mathbf{b} \text{ \& } \vec{UT} = \mathbf{c}$ <p>Show that PR and VT are parallel.</p>	
<p>26th</p>	<p>27th</p>	<p>28th</p>	<p>29th</p>	<p>30th</p>	<p>31st</p>	<p>1st April</p>	
<p>The ratio of men to women in a company is 9:11. Of the men, 10% are left handed. 95% of the women are right handed. What percentage of the company are left handed?</p>	<p>Write 1.135 as an improper fraction in its simplest form.</p>	<p>A computer is reduced in a sale by 10%. Its sale price is £646.92. What was its price before the reduction?</p>	<p>(a) The value of x is 0.021 rounded to 2 significant figures. Write down the interval range of x.</p> <p>(b) Estimate the value of $\frac{391.1 \times 9.72}{0.781}$</p>	<p>Find the value of</p> <p>(a) 12^0</p> <p>(b) $125^{4/3}$</p> <p>(c) $\left(\frac{8}{27}\right)^{-5/3}$</p>	<p>The first 7 terms of the Tribonacci Sequence are 1, 1, 1, 3, 5, 9,...</p> <p>The rule to continue the Tribonacci Sequence is "the next term in the sequence is the sum of the previous 3 terms".</p> <p>(a) Write down the next 3 Tribonacci numbers.</p> <p>(b) The first four terms of a different tribonacci sequence are a, a, b, 2a+b. Show that the 7th term is $10a + 7b$</p> <p>(c) The fourth term is 21 and the 7th term is 123. Find the values of a and b.</p>		