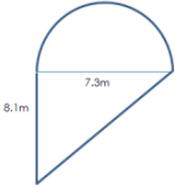
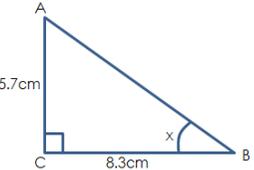
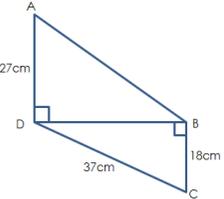
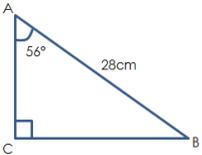
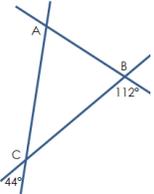
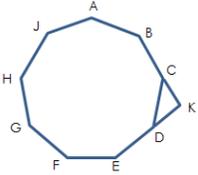


## A BIT OF MATHS EACH DAY – FOUNDATION TIER – DECEMBER 2017

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY												
<h1 style="color: red; font-size: 2em; margin: 0;">December</h1>		<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 <a href="http://www.corbettmaths.com">www.corbettmaths.com</a></p> <p>Or you can always tweet me @mrchadburn</p>		<p><b>1<sup>st</sup></b></p> <p>(a) Factorise fully <math>12x^2 - 16xy</math>                  (b) Expand <math>(x + 5)(x - 3)</math>                  (c) Make <math>m</math> the subject in <math>r = \sqrt{2m - 3}</math></p>	<p><b>2<sup>nd</sup></b></p> <p>The diagram shows the plan of a garden. It is to be filled with gravel. Gravel comes in bags costing £8.99 each, each bag covers approximately <math>4m^2</math>. How much will it cost to gravel the whole garden?</p>	<p><b>3<sup>rd</sup></b></p> 												
<p><b>4<sup>th</sup></b></p> <p>A recipe for almond biscuits makes 16 biscuits.                  120g flour                  80g of butter                  40g of icing sugar                  20g of ground almonds.                  How much of each ingredient is required to make 28 biscuits?</p>	<p><b>5<sup>th</sup></b></p> <p>The time taken to complete a mathematics test by 60 students is shown in the table below. Display this information using a frequency polygon.</p> <table border="1" style="margin: auto;"> <thead> <tr> <th>Height (<math>t</math> seconds)</th> <th>Frequency</th> </tr> </thead> <tbody> <tr> <td><math>0 &lt; t \leq 6</math></td> <td>7</td> </tr> <tr> <td><math>6 &lt; t \leq 12</math></td> <td>17</td> </tr> <tr> <td><math>12 &lt; t \leq 18</math></td> <td>20</td> </tr> <tr> <td><math>18 &lt; t \leq 24</math></td> <td>11</td> </tr> <tr> <td><math>24 &lt; t \leq 30</math></td> <td>5</td> </tr> </tbody> </table>	Height ( $t$ seconds)	Frequency	$0 < t \leq 6$	7	$6 < t \leq 12$	17	$12 < t \leq 18$	20	$18 < t \leq 24$	11	$24 < t \leq 30$	5	<p><b>6<sup>th</sup></b></p> <p>Find the size of angle <math>x</math> correct to 1 decimal place.</p> 	<p><b>7<sup>th</sup></b></p> <p>The <math>n</math>th term of a sequence is <math>n^2 - 5</math></p> <p>(a) What would the first 4 terms of the sequence be?                  (b) Will 140 be a term in this sequence? You must explain your answer.</p>	<p><b>8<sup>th</sup></b></p> <p>Without using a calculator, work out the answer to <math>\frac{2}{3} \div 1\frac{5}{6}</math></p>	<p><b>9<sup>th</sup></b></p> 	<p><b>10<sup>th</sup></b></p> <p>Find the length AB. Give your answer correct to 1 decimal place.</p>
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<p><b>11<sup>th</sup></b></p> <p>A mathematics private tutor advertises that "8 out of 10 students improve their maths grade after tuition from me". In a survey, of 35 students taught by this tutor, 27 improved their grade. Does this support the tutors claim? You must show how you came by your answer.</p>	<p><b>12<sup>th</sup></b></p> <p>Solve the equations                  (a) <math>3x + 9 = 3</math>                  (b) <math>4x - 2 = 7x + 2</math>                  (c) <math>3(2x - 3) = 4(3 - 5x)</math></p>	<p><b>13<sup>th</sup></b></p> <p>Find the length of AC correct to 1 decimal place.</p> 	<p><b>14<sup>th</sup></b></p> <p>Solve the equation <math>x^2 + 9x - 36 = 0</math></p>	<p><b>15<sup>th</sup></b></p> <p>Tom, Ellen and Delia received £320. The ratio of the amount Tom gets to the amount Ellen gets is in the ratio 3 : 7. Tom gets £84 less than Ellen. What percentage of the total does Delia receive?</p>	<p><b>16<sup>th</sup></b></p> <table border="1" style="margin: auto;"> <thead> <tr> <th>Weight (<math>w</math> kg)</th> <th>Frequency</th> </tr> </thead> <tbody> <tr> <td><math>30 &lt; w \leq 40</math></td> <td>2</td> </tr> <tr> <td><math>40 &lt; w \leq 50</math></td> <td>11</td> </tr> <tr> <td><math>50 &lt; w \leq 60</math></td> <td>26</td> </tr> <tr> <td><math>60 &lt; w \leq 70</math></td> <td>18</td> </tr> <tr> <td><math>70 &lt; w \leq 80</math></td> <td>3</td> </tr> </tbody> </table>	Weight ( $w$ kg)	Frequency	$30 < w \leq 40$	2	$40 < w \leq 50$	11	$50 < w \leq 60$	26	$60 < w \leq 70$	18	$70 < w \leq 80$	3	<p><b>17<sup>th</sup></b></p> <p>The weights of 60 people in kg are shown in the table.                  (a) Which group does the median lie in?                  (b) Estimate the mean weight, giving your answer to 2dp.</p>
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<p><b>18<sup>th</sup></b></p> 	<p><b>19<sup>th</sup></b></p> <p>In a bag there are 42 red counters and 56 blue counters.                  (a) What percentage of the counters are red?                  (b) What is the ratio of red to blue counters. Give your answer in its simplest form.</p>	<p><b>20<sup>th</sup></b></p> <p>A container in the shape of a cuboid measures 25cm by 50cm by 80cm. It is filled with water using a jug that has a capacity of 1.5litres. How many times will you need to fill the jug to completely fill the container?</p>	<p><b>21<sup>st</sup></b></p> <p>Solve the equation <math>\frac{2x + 1}{3} - \frac{x}{5} = 2</math></p>	<p><b>22<sup>nd</sup></b></p> <p>Trains to Huddersfield leave the train station every 18 minutes. Trains to Rotherham leave the train station every 24 minutes. A train to Huddersfield and a train to Rotherham both leave the train station at 8.45am. When will they next leave together?</p>	<p><b>23<sup>rd</sup></b></p> <p>(a) Write 0.0004023 in standard form                  (b) Write <math>4.51 \times 10^4</math> as a normal number.                  (c) Work out the answer to <math>(3.1 \times 10^{-1}) \div (5.3 \times 10^6)</math> giving your final answer in standard form, correct to 3 significant figures.</p>	<p><b>24<sup>th</sup></b></p> <p>There are 212 pupils in a year group. 104 are boys. <math>\frac{3}{8}</math> of the boys walk to school. <math>\frac{5}{12}</math> of the girls walk to school. How many students don't walk to school?</p>												
<p><b>25<sup>th</sup></b></p>  <p>Merry Christmas!                  It's Christmas day – you deserve a day off!!</p>	<p><b>26<sup>th</sup></b></p> <p>The heights of 8 boys are measured in m...                  1.46m, 1.61m, 1.39m, 1.81m, 1.59m, 1.66m, 1.77m, 1.6m                  Work out...                  (a) the median height                  (b) the range of the heights                  (c) the mean height.</p>	<p><b>27<sup>th</sup></b></p> <p>The price of the train ticket from Sheffield to Penistone increased by £4.20. This represented a 7% increase. What was the price of the ticket before the increase?</p>	<p><b>28<sup>th</sup></b></p> <p>Frank thinks that <math>(x + 9)^2 = x^2 + 81</math>. Is Frank right? You must explain how you came by your answer.</p>	<p><b>29<sup>th</sup></b></p> <p>Wayne has two bags of counters. The first has 5 red and 3 white counters in it. The second has 8 red and 5 white counters in it. A counter is taken, at random, from each bag. Draw a tree diagram to illustrate this and work out the probability the counters are of different colours.</p>	<p><b>30<sup>th</sup></b></p> 	<p><b>31<sup>st</sup></b></p> <p>ABCDEFGHK is a regular nonagon (9 sides).                  EDK and BCK are straight lines. Work out the size of angle CKD. You must show how you got your answer.</p>												