

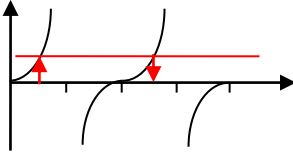
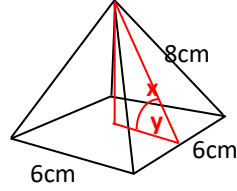
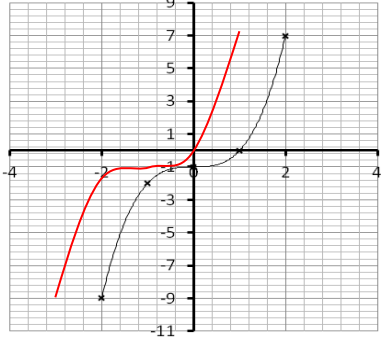
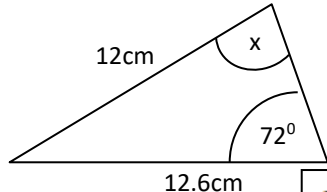
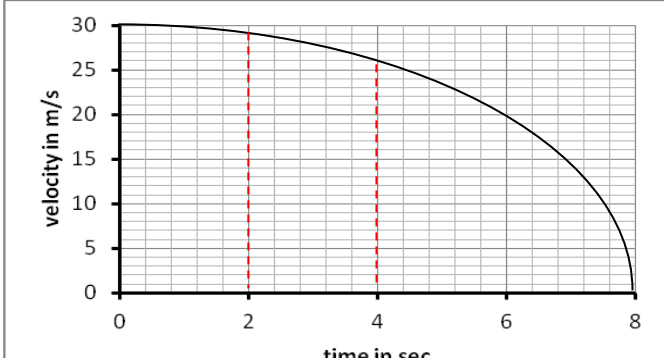
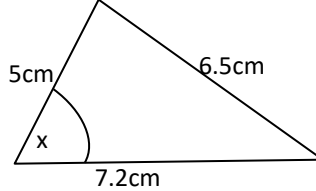
# Maths Key Skills

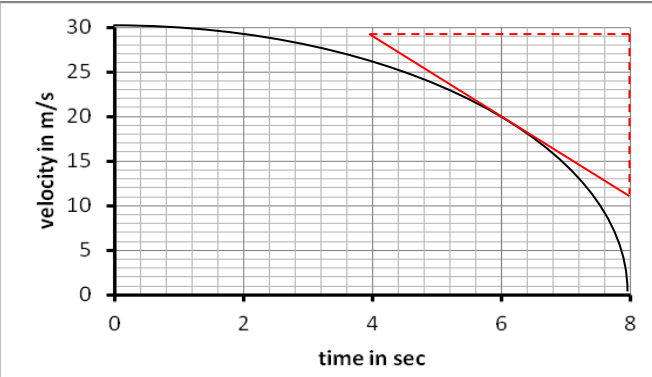
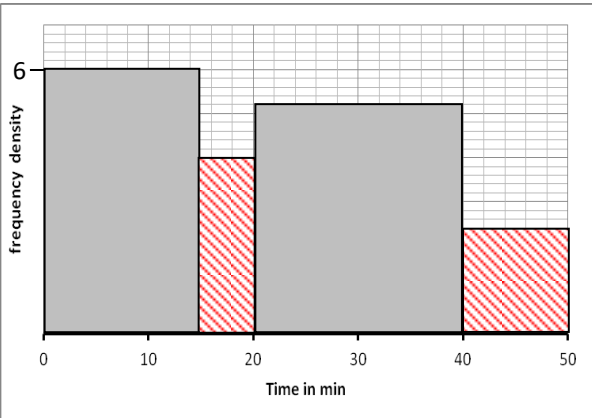
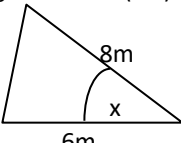
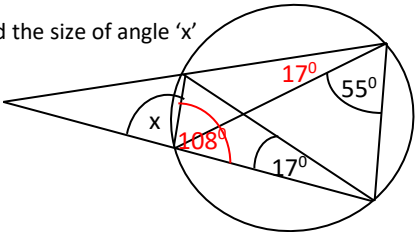
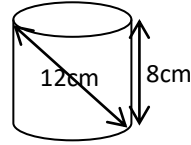
Name: .....

Date: .....

## Stage 11: Skill Check 15 Answers

Class/Group: .....

A: Number & Algebra		B: Algebra, Proportion, Geometry & Measure		C: Geometry & Measure & Statistics	
1. Simplify: $6\sqrt{12} \div 2\sqrt{3}$	11:1 $3\sqrt{4}=6$	11. Make (x) the new subject of: $w = \frac{3x}{xy+1}$	$wxy+w=3x$ ; $wxy-3x=-w$ $x(wy-3)=-w$ ; $x=-w/(wy-3)$ or $x=w/(3-wy)$	21. Work out the angle between the face and base. (correct to 3sf)	11:26 66.1°
2. Rationalise & simple: $\frac{6}{\sqrt{8}}$	11:2 $\frac{3\sqrt{2}}{2}$	12. This is the graph of $y = \tan x$ $\tan 45^\circ = 1$ ; give another angle for which $\tan(\ ) = 1$			$x = \sqrt{8^2 - 3^2} = \sqrt{55}$ $\cos y = 3 \div \sqrt{55} = 0.404\dots$ $y = 66.1^\circ$
$\frac{6 \times \sqrt{8}}{\sqrt{8} \times \sqrt{8}} = \frac{6\sqrt{8}}{8} = \frac{12\sqrt{2}}{8} = \frac{3\sqrt{2}}{2}$		13. This is the graph of $y = f(x)$ . Sketch on the grid: $y = f(x+1)$		22. Find the angle 'x' (1dp)	11:27 87.0°
3. A bag contains 2kg of flour (to nearest 100g). Each cake needs 180g (to nearest 10g). Work out the maximum number of cakes that can be made.	11:3 2050 ÷ 175 = <b>11/12</b>				$\frac{\sin x}{12.6} = \frac{\sin 72}{12}$ $\sin x = \frac{12 \sin 72}{12.6}$ $\sin x = 0.998\dots$ $x = 87.0^\circ$
4. Simplify the following fraction: $\frac{2x^2 - 11x + 5}{4x^2 - 1}$	11:4 $\frac{x-5}{2x+1}$	14. Estimate & interpret the area under the graph between 0 & 4s			
$\frac{(2x-1)(x-5)}{(2x-1)(2x+1)} = \frac{x-5}{2x+1}$				Distance 59+ 55 <b>=114m</b> in 0-4s	
5. Solve: $\frac{x+1}{2} = \frac{3}{x-4}$	11:5 <b>x=5 or -2</b>	15. Write down the equation of the tangent at (-2,5) on the circle with centre (2,-1)	$m_{\text{radius}} = (5-(-1)) \div (-2-2) = 6/-4 = -3/2$ $m_{\text{tangent}} = 2/3$ Equation of tangent: $y = \frac{2}{3}x + c$ $(-2, 5): 5 = \frac{2}{3}(-2) + c$ ; $c = 19/3$ Equation: $y = \frac{2}{3}x + \frac{19}{3}$ or <b><math>3y = 2x + 19</math></b>		
$x^2 - 3x - 4 = 6$ $x^2 - 3x - 10 = 0$ $(x-5)(x+2) = 0$ $x = 5 \text{ or } -2$				23. Find the angle 'x' (1dp)	11:28 61.3°
					$\cos x = \frac{5^2 + 7.2^2 - 6.5^2}{2 \times 5 \times 7.2}$ $= 0.480\dots$ $x = 61.3^\circ$

<p>6. If <math>f(x) = 2x-1</math> and <math>g(x) = 5-3x</math> Evaluate <math>g(f(x))</math></p>	<p>11:7 8-6x</p>	<p>16. Estimate &amp; interpret the gradient of the tangent at 6s.</p> 	<p>11:20 Average deceleration of <math>4.5\text{m/s}^2</math> at 6s or acceleration of <math>-45\text{m/s}^2</math></p>	<p>24. <math>\overrightarrow{AB} = \frac{3}{4}(2\mathbf{a} - \mathbf{b})</math> <math>\overrightarrow{CD} = 3(\mathbf{b} - 2\mathbf{a})</math></p> <p>What can you deduce about these two vectors?</p>	<p>11:29 Any</p>															
<p>7. Find the turning point of: <math>y = x^2 - x - 1</math></p>	<p>11:8 (0.5, -1.25)</p>			<ul style="list-style-type: none"> <li>Parallel</li> <li>Opposite direction</li> <li>CD=4AB</li> </ul>																
<p>8. Solve by completing the square: <math>x^2 + 8x + 5 = 0</math> (Write down the EXACT values)</p>	<p>11:9 <math>x = -4 + \sqrt{11}</math> or <math>-4 - \sqrt{11}</math></p>	<p>17. <math>4x^2 + 5x - 8 = 0</math> can be solved using the iteration formula: <math>x_{n+1} = \sqrt{\frac{8-5x_n}{4}}</math> Correct to 2dp Start with <math>x_1 = 1</math> &amp; work out an approximation for x by finding <math>x_5</math></p>	<p>11:21 0.91</p>	<p>25. Complete the table &amp; histogram:</p>  <table border="1" data-bbox="1482 1011 2049 1289"> <thead> <tr> <th>Time(min)</th> <th>Frequency</th> <th>fd</th> </tr> </thead> <tbody> <tr> <td><math>0 &lt; t \leq 15</math></td> <td>90</td> <td>6</td> </tr> <tr> <td><math>15 &lt; t \leq 20</math></td> <td>20</td> <td>4</td> </tr> <tr> <td><math>20 &lt; t \leq 40</math></td> <td>104</td> <td>5.2</td> </tr> <tr> <td><math>40 &lt; t \leq 50</math></td> <td>24</td> <td>2.4</td> </tr> </tbody> </table>	Time(min)	Frequency	fd	$0 < t \leq 15$	90	6	$15 < t \leq 20$	20	4	$20 < t \leq 40$	104	5.2	$40 < t \leq 50$	24	2.4	<p>11:30</p>
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<p>9. To solve: <math>5x^2 - x = 2</math> by formula. Give answers in surd form.</p>	<p>11:10 <math>\frac{1 \pm \sqrt{41}}{10}</math></p>	<p>18. The area of the triangle is <math>15\text{m}^2</math>. (2sf) Work out the angle x (Correct to 2sf)</p>  <p><math>15 = 0.5 \times 6 \times 8 \sin x</math> <math>\sin x = 15 \div 24 = 0.625</math></p>	<p>11:22 39°</p>																	
<p>10. Write down the solution set for: <math>(x+7)(x+3) &gt; 0</math></p>	<p>11:11 {x: x &lt; -7 or x &gt; -3}</p>	<p>19. Find the size of angle 'x'</p> 	<p>11:23 180 - 108 = 72°</p>	<p>20. Work out the diameter of the cylinder (give answer in simplified surd form)</p>  <p><math>\sqrt{12^2 - 8^2}</math> <math>= \sqrt{80}</math> <math>= 4\sqrt{5} \text{ cm}</math></p>																
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<p>Test Total (A+B+C)</p>		<p>R (0-9)</p>	<p>Y (10-19)</p>	<p>G (20-25)</p>																