


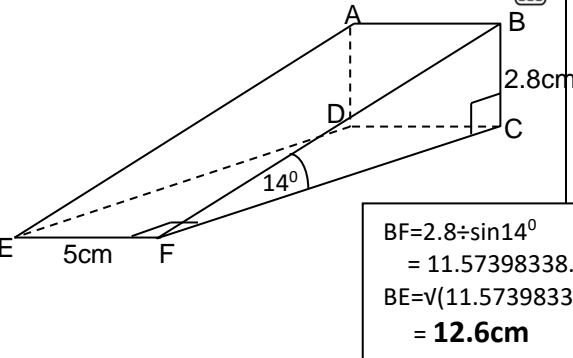
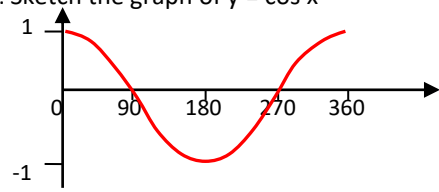

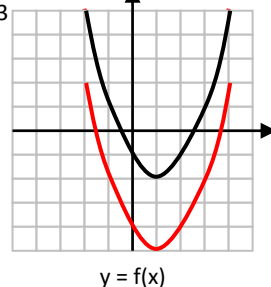
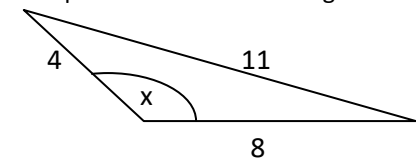
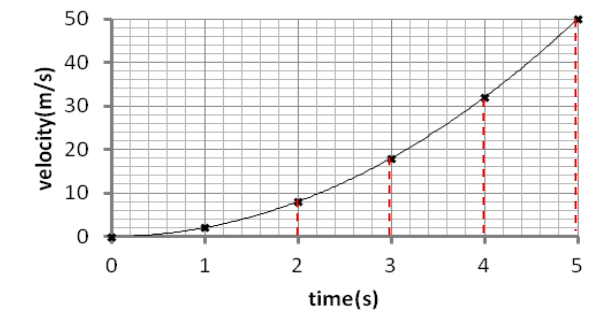
Maths Key Skills

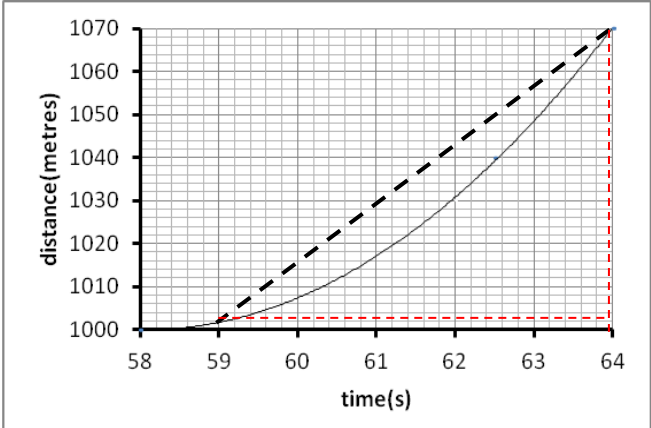
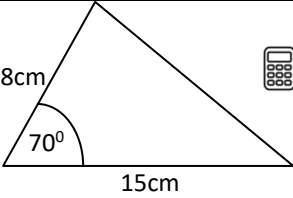
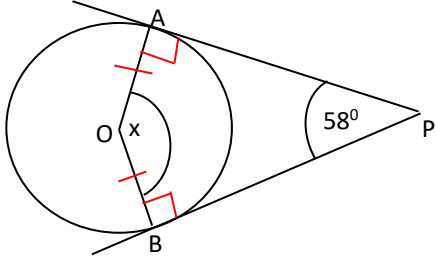
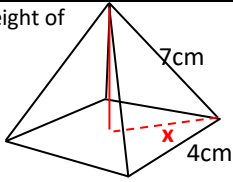
Stage 11: Skill Check 2 Answers

Name:

Date:

Class/Group:

A: Number & Algebra		B: Algebra, Proportion, Geometry & Measure	C: Geometry & Measure & Statistics
1. Simplify: $\sqrt{5} \times \sqrt{15}$	11:1 $\sqrt{75}$ $=5\sqrt{3}$	11. Make (r) the new subject of: $P = \pi r + 2r + 2a$ $\pi r + 2r = P - 2a$ $r(\pi + 2) = P - 2a$ $r = \frac{P - 2a}{\pi + 2}$	21. Work out the length BE. (correct to 3sf)  11:26  <div data-bbox="1848 454 2184 646" style="border: 1px solid black; padding: 5px;"> $BF = 2.8 \div \sin 14^\circ$ $= 11.57398338..$ $BE = \sqrt{(11.57398338..^2 + 5^2)}$ $= 12.6\text{cm}$ </div>
2. Expand & simplify: : $(\sqrt{3} + 2)(\sqrt{3} + 5)$	11:2 $3 + 7\sqrt{3} + 10$ $= 7\sqrt{3} + 13$	12. Sketch the graph of $y = \cos x$ 	22. $\frac{\sin x}{8} = \frac{\sin 72^\circ}{11}$ Find x (correct to 1dp)  11:27 43.8° <div data-bbox="1859 805 2184 1005" style="border: 1px solid black; padding: 5px;"> $\sin x = \frac{8 \sin 72}{11}$ $= 0.691.....$ </div>
3. If $x=6.4(1\text{dp})$ and $y=8.3(1\text{dp})$ Work out maximum value of $y - x$.	11:3 $8.35 - 6.35$ $= 2$	13. Sketch on the grid: $y = f(x) - 3$ 	23. Set up the formula to find angle 'x'?' 11:28  <div data-bbox="1870 1276 2184 1516" style="border: 1px solid black; padding: 5px;"> $\cos x = \frac{4^2 + 8^2 - 11^2}{2 \times 4 \times 8}$ </div>
4. Simplify the following fraction: $\frac{2}{y+3} + \frac{3}{y-2}$	11:4 $\frac{2y-4+3y+9}{(y+3)(y-2)}$ $= \frac{5y+5}{(y+3)(y-2)}$	14. Estimate the distance travelled between 2 and 5 seconds. 	11:16 $\frac{1}{2} \times 1 \times (8 + 2(18 + 32) + 50)$ $= 79\text{m}$
5. Solve: $\frac{x}{2x-3} + \frac{4}{x+1} = 1$ $\frac{x^2 + x + 8x - 12}{(2x-3)(x+1)} = 1$ $x^2 + 9x - 12 = 2x^2 - x - 3$ $x^2 - 10x + 9 = 0$ $(x-9)(x-1) = 0$ $x = 9 \text{ or } 1$	11:5	15. Write down the equation of the tangent at (1,3) on the circle $x^2 + y^2 = 10$ $m_{\text{radius}} = (3-0) \div (1-0) = 3$ $m_{\text{tangent}} = -\frac{1}{3}$ equation of tangent: $y = -\frac{1}{3}x + c$ $(1,3): 3 = -\frac{1}{3}(1) + c$ $c = 10/3$ Equation of tangent: $y = -\frac{1}{3}x + 10/3$ or $3y + x = 10$	11:18

<p>6. If $f(x) = 4x - 1$, work out: $f^{-1}(x)$</p>	<p>11:7 $\frac{x+1}{4}$</p>	<p>16. Estimate the gradient of the chord, give meaning & units units.</p> 	<p>11:20 Average speed over 59-64s $68 \div 5$ 13.6m/s</p>	<p>24. If $\vec{AB} = -\mathbf{a} + \mathbf{b}$ & $\vec{BC} = \frac{1}{2}(\mathbf{b} - \mathbf{a})$</p> <p>What can you say about these two vectors?</p>	<p>11:29 Same vectors So parallel Common letter 'B' So A, B & C are collinear (in a line)</p>																		
<p>7. Find the turning point of: $y = x^2 - 2x + 3$</p>	<p>11:8 $(x-1)^2 - 1 + 3$ $= (x-1)^2 + 2$ (1,2)</p>	<p>17. $x^2 - 5x + 2 = 0$ can be solved using the iteration formula: $x_{n+1} = \sqrt{5x_n - 2}$</p> <p>Start with $x_1 = 4$ and work out an approximation for x by finding x_5 correct to 2dp.</p>	<p>11:21 4.53</p>	<p>25. Complete the table:</p> <table border="1" data-bbox="1491 687 2042 1054"> <thead> <tr> <th>School day absences/year (d)</th> <th>Frequency</th> <th>Frequency Density</th> </tr> </thead> <tbody> <tr> <td>$0 < d \leq 2$</td> <td>30</td> <td>$30 \div 2 = 15$</td> </tr> <tr> <td>$2 < d \leq 4$</td> <td>26</td> <td>$26 \div 2 = 13$</td> </tr> <tr> <td>$4 < d \leq 7$</td> <td>27</td> <td>$27 \div 3 = 9$</td> </tr> <tr> <td>$7 < d \leq 10$</td> <td>18</td> <td>$18 \div 3 = 6$</td> </tr> <tr> <td>$10 < d \leq 15$</td> <td>20</td> <td>$20 \div 5 = 4$</td> </tr> </tbody> </table>	School day absences/year (d)	Frequency	Frequency Density	$0 < d \leq 2$	30	$30 \div 2 = 15$	$2 < d \leq 4$	26	$26 \div 2 = 13$	$4 < d \leq 7$	27	$27 \div 3 = 9$	$7 < d \leq 10$	18	$18 \div 3 = 6$	$10 < d \leq 15$	20	$20 \div 5 = 4$	<p>11:30</p>
School day absences/year (d)	Frequency	Frequency Density																					
$0 < d \leq 2$	30	$30 \div 2 = 15$																					
$2 < d \leq 4$	26	$26 \div 2 = 13$																					
$4 < d \leq 7$	27	$27 \div 3 = 9$																					
$7 < d \leq 10$	18	$18 \div 3 = 6$																					
$10 < d \leq 15$	20	$20 \div 5 = 4$																					
<p>8. Solve by completing the square: $x^2 - 4x - 7 = 0$ (Write down the EXACT values)</p>	<p>11:9 $x = \pm\sqrt{11} + 2$</p> <p>$(x-2)^2 - 4 - 7 = 0$ $(x-2)^2 - 11 = 0$ $(x-2)^2 = 11$ $x = \pm\sqrt{11} + 2$</p>	<p>18. Work out the area of this triangle. (3sf)</p> 	<p>11:22 $0.5 \times 8 \times 15 \times \sin 70^\circ$ 56.4cm²</p>																				
<p>9. To solve: $2x^2 + 6x + 3 = 0$ by formula, substitute the appropriate values.</p>	<p>11:10 $a=2, b=6, c=3$ $\frac{-6 \pm \sqrt{12}}{4}$</p>	<p>19. O is the centre. Work out angle x.</p> 	<p>11:23 $x = 360 - (180 + 58)$ $x = 122^\circ$</p>																				
<p>10. Write down the solution set for: $(x + 5)(x - 4) \leq 0$</p>	<p>11:11 $\{x: -5 \leq x \leq 4\}$</p>	<p>20. Work out the perpendicular height of the square based pyramid. (1dp)</p> 	<p>11:24 $x = \sqrt{8}$ Height = $\sqrt{7^2 - \sqrt{8}^2}$ $= \sqrt{41}$ 6.4cm</p>																				
<p>Total (A)</p>		<p>Total (B)</p>		<p>Total (C)</p>																			
<p>Test Total (A+B+C)</p>		<p>R (0-9)</p>	<p>Y (10-19)</p>	<p>G (20-25)</p>																			