

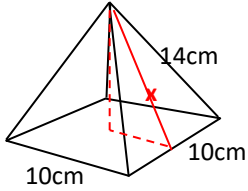
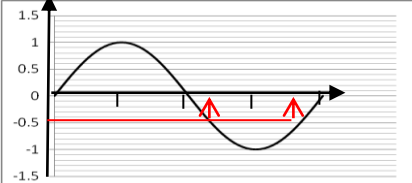
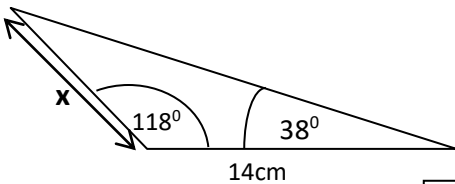
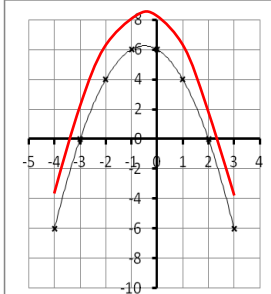
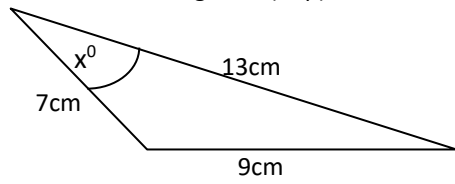
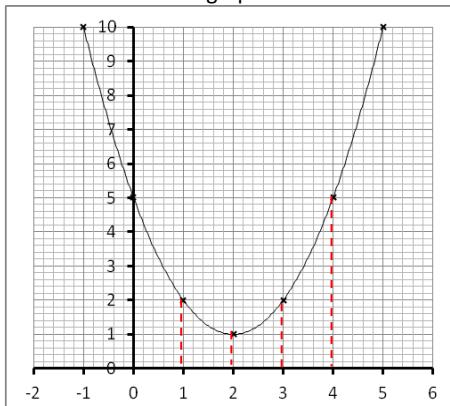
# Maths Key Skills

Name: .....

Date: .....

## Stage 11: Skill Check 6 Answers

Class/Group: .....

A: Number & Algebra	B: Algebra, Proportion, Geometry & Measure	C: Geometry & Measure & Statistics
<p>1. Express <math>\sqrt{72}</math> in the form <math>a\sqrt{b}</math></p> <p><b>11:1</b> <b><math>6\sqrt{2}</math></b></p>	<p>11. Make (b) the new subject of : <math>ab = b + x</math></p> <p><b>11:12</b> <math>b = \frac{x}{a-1}</math></p>	<p>21. Work out the angle that base makes with the sloping face. (correct to 3sf)</p> <p><b>11:26</b>  <math>x = \sqrt{171}</math>  <math>\cos = \frac{5}{\sqrt{171}}</math>  <math>= 0.382</math>  <b><math>67.5^\circ</math></b></p> 
<p>2. Expand &amp; simplify: <math>(2+\sqrt{3})(7-\sqrt{3})</math></p> <p><b>11:2</b> <b><math>11+5\sqrt{3}</math></b></p>	<p>12. This the graph of <math>y = \sin x</math> Give two solutions for <math>\sin x = -0.5</math></p> <p><b>11:14</b> <b><math>210^\circ</math></b> <b><math>330^\circ</math></b></p> 	<p>22. Find the length of side 'x'? (1dp)</p> <p><b>11:27</b> <b><math>21.2\text{cm}</math></b></p>  <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <math display="block">\frac{x}{\sin 38} = \frac{14}{\sin 24}</math> <math display="block">x = \frac{14 \sin 38}{\sin 24}</math> </div>
<p>3. If <math>x=16.4</math>(1dp) and <math>y=4.7</math>(1dp) Work out maximum value of <math>x - y</math></p> <p><b>11:3</b> <math>16.45 - 4.65</math> <b><math>= 11.8</math></b></p>	<p>13. This is the graph of <math>y = f(x)</math>. Sketch on the grid: <math>y = f(x)+2</math></p> <p><b>11:15</b></p> 	<p>23. Find the size of angle 'x'? (1dp)</p> <p><b>11:28</b> <b><math>41.2^\circ</math></b></p>  <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <math display="block">\cos x = \frac{13^2 + 7^2 - 9^2}{2 \times 13 \times 7}</math> <math display="block">\cos x = 0.7527 \dots</math> </div>
<p>4. Simplify the following fraction:</p> $\frac{8}{x-1} + \frac{3x}{(x-1)^2}$ <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <math display="block">\frac{8(x-1)+3x}{(x-1)^2}</math> <math display="block">= \frac{11x-8}{(x-1)^2}</math> </div>	<p>14. Estimate the area under the graph between <math>x = 0</math> and 4</p> <p><b>11:16</b> <math>\frac{1}{2}(5+2) \cdot 1</math> <math>+ \frac{1}{2}(2+1) \cdot 1</math> <math>= 5</math>  <math>2 \times 5</math> <b><math>= 10</math></b></p> 	<p>15. Write down the equation of the tangent at <math>(-1,3)</math> on the circle <math>x^2+y^2 = 10</math></p> <p><b>11:18</b></p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <math display="block">m_{\text{radius}} = (3-0) \div (-1-0) = -3 \quad m_{\text{tangent}} = 1/3</math> <math display="block">\text{Equation of tangent: } y = \frac{1}{3}x + c</math> <math display="block">(-1,3): 3 = \frac{1}{3}(-1) + c; c = 10/3</math> <math display="block">\text{Equation of tangent: } \mathbf{y = \frac{1}{3}x + 10/3 \text{ or } 3y = x + 10}</math> </div>

6. If  $f(x) = x^2$  and  $g(x) = 2x+3$   
Find the values of 'x' for which  $f(x) = g(x)$ .

11:7

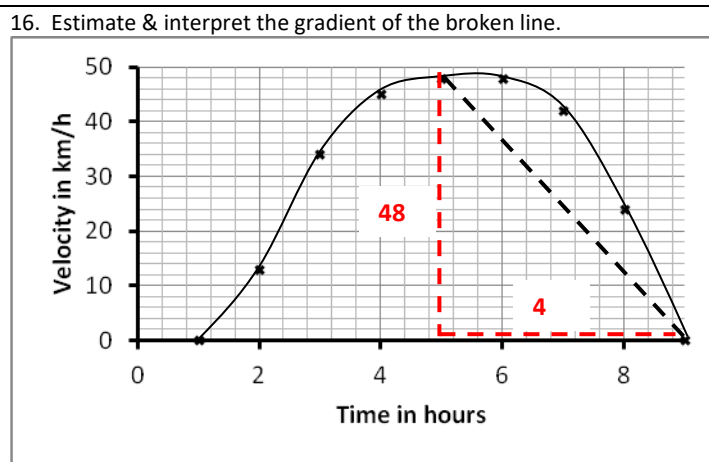
$x^2 = 2x+3$   
 $x^2-2x-3=0$   
 $(x+1)(x-3)=0$   
 **$x = -1$  or  $3$**

7. Find the turning point of:  
 $y = x^2 - 6x + 10$

11:8

$(x-3)^2 - 9 + 10$   
 $(x-3)^2 + 1$

**(3,1)**



11:20

Average deceleration of  $12\text{km/h}^2$  or Acceleration of  $-12\text{km/h}^2$  Over the last 4 hours

24. If  $\overline{AB} = 2\mathbf{a}$  and  $\overline{CB} = 2\mathbf{a} - \mathbf{b}$   
Express  $\overrightarrow{CA}$  in terms of  $\mathbf{a}$  and  $\mathbf{b}$

11:29

$2\mathbf{a} - 2\mathbf{a}$   
 $= -\mathbf{b}$

8. Solve by completing the square:  
 $x^2 + 6x - 7 = 0$

11:9

$(x+3)^2 - 9 - 7 = 0$   
 $(x+3)^2 = 16$   
 $x+3 = \pm 4$   
 **$x = +4 - 3 = 1$**   
 **$x = -4 - 3 = -7$**

17.  $x^2 - 7x + 1 = 0$  can be solved using the iteration formula:  
 $x_{n+1} = \sqrt{7x_n - 1}$   
Start with  $x_1 = 6$  and work out an approximation for x by finding  $x_5$  (to 2dp)

11:21

**6.82**

18. Work out the area of this triangle (Correct to 1dp)

3.5cm

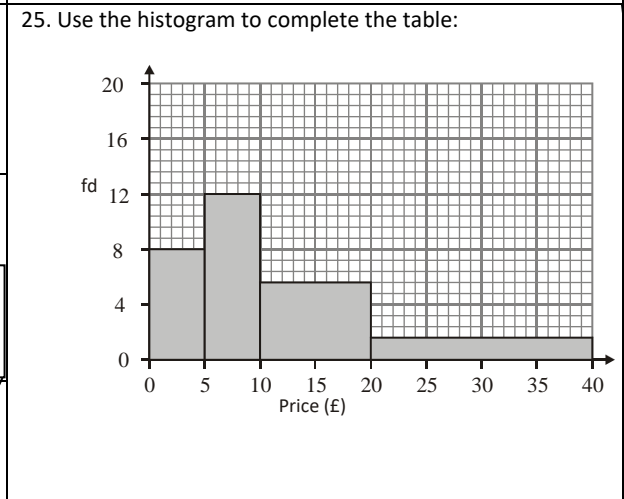
$58^\circ$

4.6cm

**$A = 0.5 \times 3.5 \times 4.6 \times \sin 58^\circ = 6.826 \dots$**

11:22

**$6.8\text{cm}^2$**

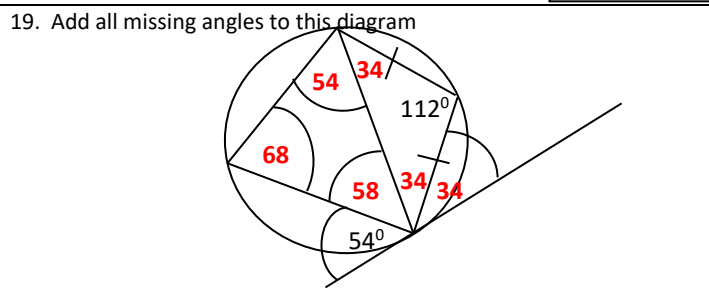


9. To solve:  $4x^2 - 7x + 2 = 0$  by formula. Give answers in surd form.

11:10

**$7 \pm \sqrt{17}$**

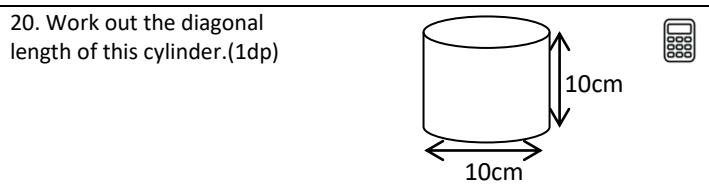
**8**



10. Write down the solution set for:  $(x - 6)(x + 2) \geq 0$

11:11

**$\{x: x \leq -2$  or  $x \geq 6\}$**



Price (£)	Frequency
$0 < x \leq 5$	$8 \times 5 = 40$
$5 < x \leq 10$	$12 \times 5 = 60$
$10 < x \leq 20$	$5.6 \times 10 = 56$
$20 < x \leq 40$	$1.6 \times 20 = 32$

Total (A)	Total (B)	Total (C)
Test Total (A+B+C)	R (0-9)	Y (10-19)
		G (20-25)