

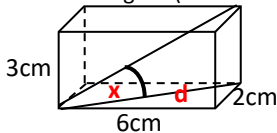
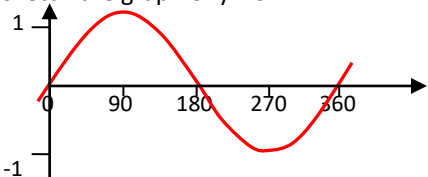

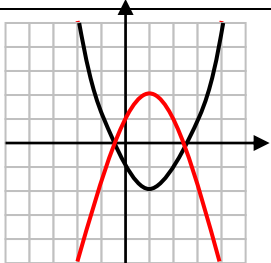
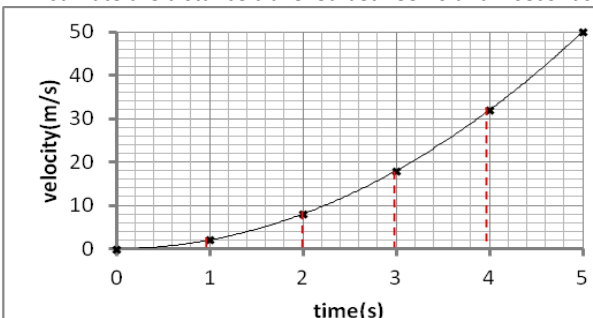

# Maths Key Skills

# Stage 11: Skill Check 1 Answers

Name: .....

Date: .....

Class/Group: .....

A: Number & Algebra		B: Algebra, Proportion, Geometry & Measure	C: Geometry & Measure & Statistics
1. Write $\sqrt{50}$ in the form $k\sqrt{2}$	11:1 $5\sqrt{2}$	11. Rearrange the formula: $ab + bc = T$ to make 'b' the new subject.  $b = \frac{T}{a+c}$	21. Work out the marked angle x (correct to 3sf)  $d = \sqrt{40}$ $\tan x = \frac{3}{\sqrt{40}}$ $= 0.474..$  <b>25.4°</b>
2. Rationalise the denominator: $\frac{1}{\sqrt{5}}$	11:2 $\frac{\sqrt{5}}{5}$	12. Sketch the graph of $y = \sin x$ 	22. $\frac{x}{\sin 38^\circ} = \frac{8\text{cm}}{\sin 60^\circ}$ Find x (correct to 1dp)   <b>5.7cm</b>
3. If $x = 6.4$ (1dp) and $y = 8.3$ (1dp) Work out maximum value of $x + y$	11:3 $6.45 + 8.35$ <b>= 14.8</b>	13. Sketch on the grid: $y = -f(x)$  $y = f(x)$	
4. Simplify the following fraction: $\frac{x^2 + x - 6}{x^2 - 7x + 10}$	11:4 $\frac{(x+3)(x-2)}{(x-5)(x-2)}$ <b><math>\frac{x+3}{x-5}</math></b>	14. Estimate the distance travelled between 0 and 4 seconds.  $\frac{1}{2} \times 1 \times 2(2+8+18)+32 = 44\text{m}$	23. $\cos x = \frac{4^2 + 7^2 - 9^2}{2 \times 4 \times 7}$ Find angle x (correct to 3sf)   <b>107°</b>
5. Solve: $\frac{5}{x+1} + \frac{3}{x-1} = 2$  $5(x-1) + 3(x+1) = 2(x^2 - 1)$ $5x - 5 + 3x + 3 = 2x^2 - 2$ $2x^2 - 8x = 0$ $2x(x - 4) = 0$ <b><math>x = 0</math> or <math>4</math></b>	11:5	15. Write down the equation of the tangent at (3,4) on the circle $x^2 + y^2 = 25$  $m_{\text{radius}} = (4-0) \div (3-0) = 4/3$ ; $m_{\text{tangent}} = -3/4$ Equation of tangent: $y = -3/4x + c$ (3,4) $4 = -3/4(3) + c$ therefore $c = 25/4$ Equation of tangent: <b><math>y = -3/4x + 25/4</math> or <math>4y + 3x = 25</math></b>	

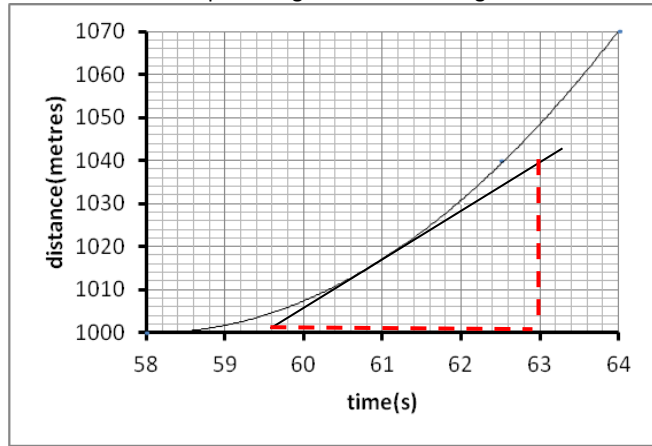
6. If  $f(x) = 2x^2 - x$ , work out  $f(3)$

11:7  
 $2(3^2) - 3$   
 $=15$

7. Find the turning point of:  
 $y = x^2 + 8x + 10$

11:8  
 $(x+4)^2 - 16 + 10$   
 $= (x+4)^2 - 6$   
 **$(-4, -6)$**

16. Estimate & interpret the gradient of the tangent at 61seconds.



11:20  
  
 $40 \div 3.4$   
 $\approx 12\text{m/s}$   
 Average speed at 61s

24. If  $\vec{AB} = -\mathbf{a} + \mathbf{b}$  &  
 $\vec{MN} = \frac{1}{2}(\mathbf{b} - \mathbf{a})$   
 What can you say about these two vectors?

11:29  
 Parallel  
 $AB = 2MN$   
 $MN = \frac{1}{2}AB$

8. Solve by completing the square:  
 $x^2 - 2x - 5 = 0$

11:9

$(x-1)^2 - 1 - 5 = 0$   
 $(x-1)^2 = 6$   
 $(x-1) = \pm\sqrt{6}$   
 **$x = \sqrt{6} + 1$  or  $-\sqrt{6} + 1$**

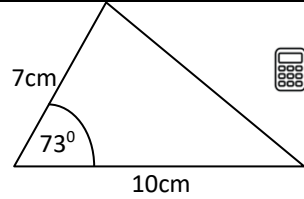
17.  $x^2 + 3x + 5 = 0$  can be solved using the iteration formula:  $X_{n+1} = \frac{5 - X_n^2}{3}$



11:21  
 **$4/3$**

Work out an approximation for x by using  $X_1 = 1$

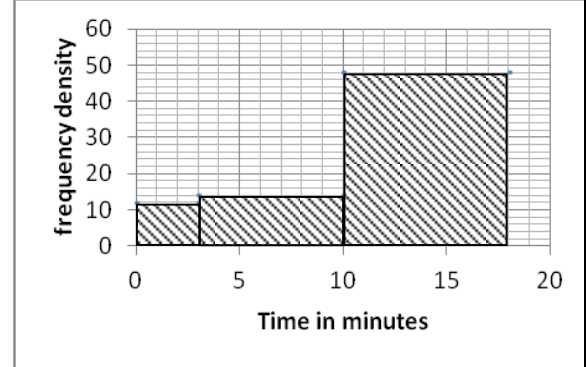
18. Work out the area of this triangle. (3sf)



11:22  
 $0.5 \times 7 \times 10 \times \sin 73^\circ$   
 **$33.5\text{cm}^2$**

25. Use the histogram to complete the frequency table:

11:30

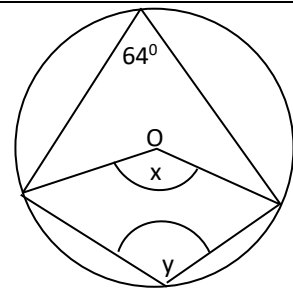


Time	Frequency
$0 < t \leq 3$	<b><math>3 \times 12 = 36</math></b>
$3 < t \leq 10$	<b><math>7 \times 14 = 98</math></b>
$10 < t \leq 18$	<b><math>8 \times 48 = 384</math></b>

9. To solve:  $3x^2 - 5x + 1 = 0$  by formula, substitute the appropriate values.

11:10  
 **$\frac{5 \pm \sqrt{13}}{6}$**

19. O is the centre. Work out the values of x & y.

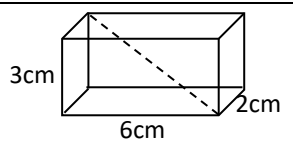


11:23  
 **$x = 128^\circ$**   
 **$y = 116^\circ$**

10. Write down the solution set for:  $(x - 5)(x - 1) \geq 0$

11:11  
 **$\{x: x \leq 1$  or  $x \geq 5\}$**

20. Work out the diagonal length of this cuboid.



11:24  
 $\sqrt{3^2 + 6^2 + 2^2}$   
 **$7\text{cm}$**

Total (A)  
 Test Total (A+B+C)

Total (B)  
 R (0-9)

Y (10-19)

Total (C)  
 G (20-25)