

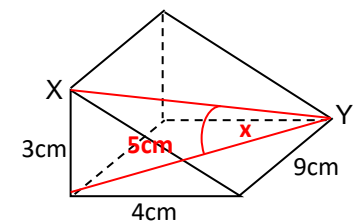
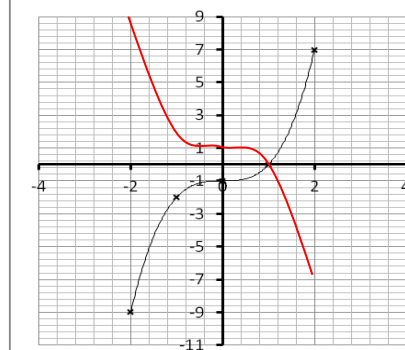
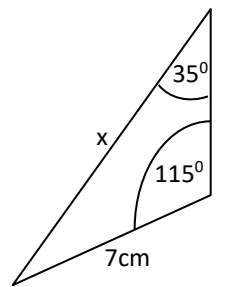
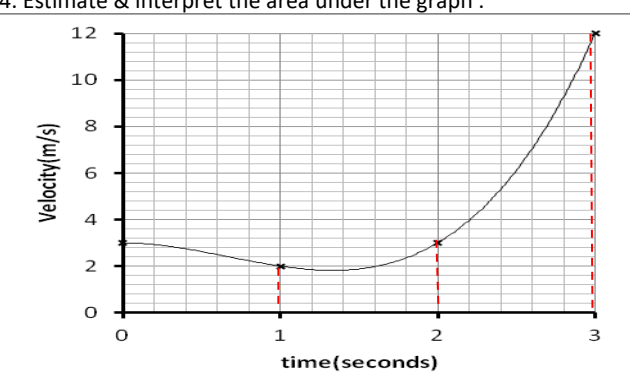
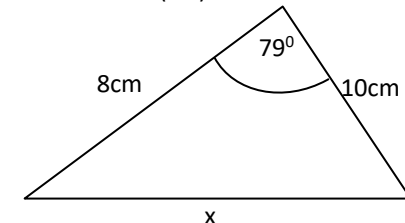
Maths Key Skills

Name:

Date:

Stage 11: Skill Check 12 Answers

Class/Group:

A: Number & Algebra		B: Algebra, Proportion, Geometry & Measure		C: Geometry & Measure & Statistics	
1. Write $\sqrt{48}$ in the form $k\sqrt{3}$	11:1 $4\sqrt{3}$	11. Make (y) the new subject of: $\frac{y}{y-t} = \frac{m}{n}$	$y = \frac{mt}{m-n}$	21. Work out the angle between XY and the base. (correct to 3sf)	11:26 16.9°
2. Rationalise the denominator & simplify: $\frac{5}{2\sqrt{8}}$	11:2 $\frac{5\sqrt{2}}{8}$	12. One solution for $\sin x = -0.8$ (1dp) is $x = 234^\circ$. Use the graph to find another solution.	11:14 $360-54=306^\circ$		XY = $\sqrt{106}$ $\sin x = 3/\sqrt{106} = 0.291\dots$ $x = 16.9^\circ$
$\frac{5}{2\sqrt{8}} \times \frac{\sqrt{8}}{\sqrt{8}} = \frac{5\sqrt{8}}{16}$ $= \frac{10\sqrt{2}}{16} = \frac{5\sqrt{2}}{8}$		13. This is the graph of $y = f(x)$. Sketch on the grid: $y = -f(x)$	11:15	22. Find the side 'x'? (1dp)	11:27 11.1cm
3. The area of a rectangle is 20m^2 (to the nearest 10) and its length is 4.82m (to the nearest cm). Work out minimum width. (2dp)	11:3 15 ÷ 4.825 = 3.11m				$\frac{x}{\sin 115} = \frac{7}{\sin 35}$ $x = \frac{7\sin 115}{\sin 35}$ $x = 11.1\text{cm}$
4. Simplify the following fraction: $\frac{x^2-9}{x^2+3x} \div \frac{x^2-6x+9}{5x}$	11:4 $\frac{5}{x-3}$	14. Estimate & interpret the area under the graph.	11:16 2.5+ 2.5+ 7.5 =12.5m Total distance over 0-3s	23. Find the side 'x'? (3sf)	11:28 11.6cm
$\frac{(x-3)(x+3)}{x(x+3)} \times \frac{5x}{(x-3)(x-3)}$ $= \frac{5}{x-3}$					$x^2 = 8^2 + 10^2 - 2(8)(10)\cos 79^\circ$ $x^2 = 133.17\dots$ $x = 11.6\text{cm}$
5. Solve: $\frac{x+3}{2} + \frac{x-5}{3} = x^2$	11:5 $x = \frac{1}{3}$ or $\frac{1}{2}$	15. Write down the equation of the tangent at (2,2) on the circle with centre (-4,-8)	11:18 $m_{\text{radius}} = (2-8)/(2-(-4)) = -10/6$ $m_{\text{tangent}} = -6/10 = -3/5$ Equation of tangent: $y = -\frac{3}{5}x + c$ (2,2): $2 = -\frac{3}{5}(2) + c$; $c = 16/5$ Equation: $y = -\frac{3}{5}x + \frac{16}{5}$ or $5y + 3x = 16$		
$3x+9+2x-10=6x^2$ $6x^2 - 5x + 1 = 0$ $(3x-1)(2x-1) = 0$ $x = \frac{1}{3}$ or $\frac{1}{2}$					

6. If $f(x) = 7-3x$ and $g(x) = x^2$, evaluate:
 $g(f(5))$

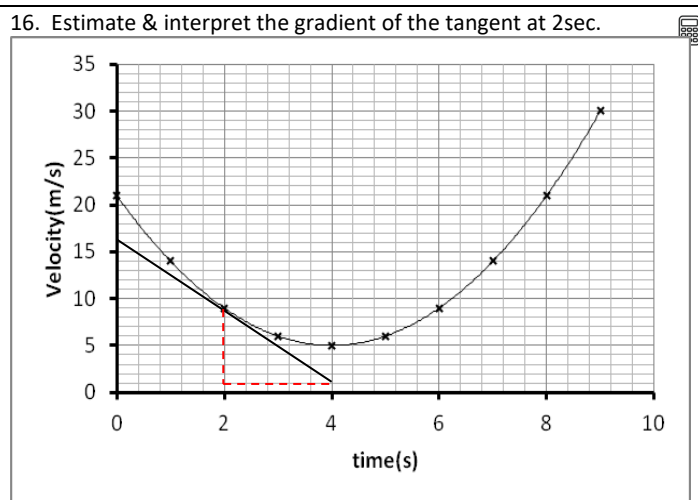
$f(5) = 7-15 = -8$
 $g(-8) = 64$

11:7
64

7. Find the turning point of:
 $y = x^2 + 8x + 13$

$(x+4)^2 - 16 + 13$
 $(x+4)^2 - 3$
 $(-4, -3)$

11:8
 $(-4, -3)$



11:20
Average deceleration of 4m/s^2 at 2s

24.
 $\vec{OA} = \frac{1}{2}(b - 2a)$
 $\vec{OB} = 3a + b$
Show that \vec{AB} can be express as $\frac{1}{2}(8a + b)$

11:29

$$\vec{AB} = -\frac{1}{2}(b - 2a) + 3a + b$$

$$\vec{AB} = -\frac{1}{2}b + a + 3a + b$$

$$\vec{AB} = 4a + \frac{1}{2}b$$

$$\vec{AB} = \frac{1}{2}(8a + b)$$

8. Solve by completing the square: $x^2 - 5x + 1.25 = 0$
(Write down the EXACT values)

$x = 2.5 + \sqrt{5}$ or $2.5 - \sqrt{5}$

$(x-2.5)^2 - 6.25 + 1.25 = 0$
 $(x-2.5)^2 - 5 = 0$
 $x = 2.5 + \sqrt{5}$ or $2.5 - \sqrt{5}$

11:9
 $x = 2.5 + \sqrt{5}$ or $2.5 - \sqrt{5}$

17. $x^2 - 5x - 8 = 0$ can be solved using the iteration formula:
 $x_{n+1} = \frac{x_n^2 - 8}{5}$
Correct to 2dp
Start with $x_1 = -2$ & work out an approximation for x by finding x_5

18. Work out the area of the triangle.
(Correct to 2sf)

$0.5 \times 2.8 \times 3.5 \times \sin 73^\circ$

11:21
-1.25

11:22
 4.7cm^2

9. To solve: $2x^2 + 5x = 10$ by formula. Give answers in surd form.

$-5 \pm \sqrt{105}$
4

11:10
 $-5 \pm \sqrt{105}$
4

19. O is the centre. Find the size of angle 'x'

11:23
90-28
 $= 62^\circ$

10. Write down the solution set for: $(x-3)(x-7) \leq 0$

$\{x: 3 \leq x \leq 7\}$

11:11
 $\{x: 3 \leq x \leq 7\}$

20. Work out the length AB. (1dp)

11:24
 $\sqrt{5^2 + 9^2}$
 $\sqrt{106}$
 $= 10.3\text{cm}$

25. Complete the table for frequency density:

Scores	Frequency	Frequency density
$0 < n \leq 20$	18	0.9
$30 < n \leq 40$	24	2.4
$40 < n \leq 60$	32	1.6
$50 < n \leq 70$	27	1.35
$70 < n \leq 100$	9	0.3

11:30

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

Total (B)
R (0-9)

Total (C)
Y (10-19)
G (20-25)