


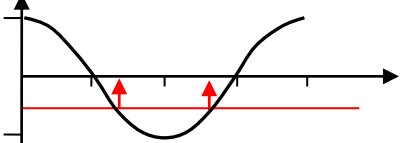
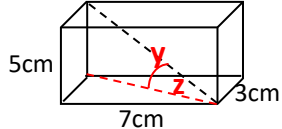

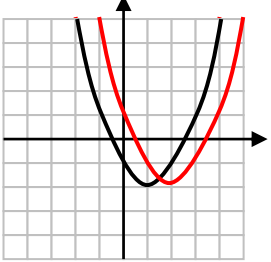
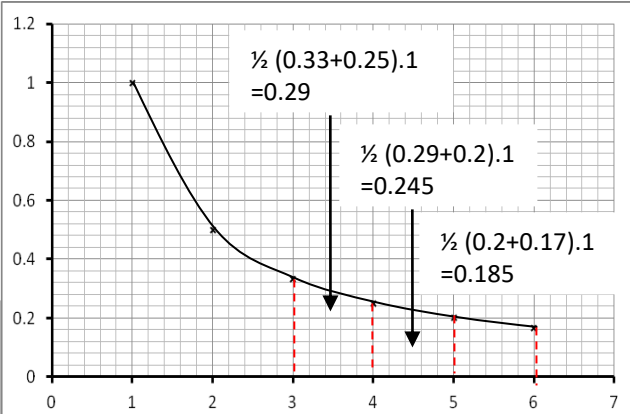
Maths Key Skills

Stage 11: Skill Check 5 Answers

Name:

Date:

Class/Group:

A: Number & Algebra		B: Algebra, Proportion, Geometry & Measure		C: Geometry & Measure & Statistics	
1. Simplify: $\sqrt{8} \div \sqrt{2}$	11:1 $2\sqrt{2} \div \sqrt{2}$ =2	11. Make (d) the new subject of : $C = \frac{3-5d}{d-4}$	11:12 $Cd-4C = 3-5d$; $Cd+5d = 3+4C$ $d(C+5) = 3+4C$; $d = \frac{3+4C}{C+5}$	21. Work out the angle that base makes with the broken line. (correct to 3sf)	11:26  33.3°
2. Rationalise & simplify: $\frac{2}{3-\sqrt{5}}$	11:2 $\frac{2}{3-\sqrt{5}} \times \frac{3+\sqrt{5}}{3+\sqrt{5}}$ $= \frac{6+2\sqrt{5}}{9-5}$ $= \frac{6+2\sqrt{5}}{4}$ $= \frac{3+\sqrt{5}}{2}$	12. This the graph of $y = \cos x$ Give two solutions for $\cos x = -0.5$	11:14  120° 240°	 $y = \sqrt{83}$ $\sin \angle z = \frac{5}{\sqrt{83}} = 0.548 \dots$ $\frac{5}{\sqrt{83}}$	
3. If $x=3.8$ (1dp) and $y=4.60$ (2dp) Work out maxim4rum value of $y \div x$.	t 	13. Sketch on the grid: $y = f(x-1)$	 $y = f(x)$	22. <u>Sine</u> or <u>Cosine</u> Rule to find side 'x'?	11:27 <i>Sine</i>
4. Simplify the following fraction: $\frac{x^2 - 8x + 15}{2x^2 - 7x - 15}$	11:4 $\frac{(x-5)(x-3)}{(2x+3)(x-5)}$ $= \frac{x-3}{2x+3}$	14. Estimate the area under the graph between $x = 3$ and 6	11:16  ≈ 0.72	23. <u>Sine</u> or <u>Cosine</u> Rule to find angle 'x'?	11:28 Cosine
5. Solve: $\frac{x+4}{x-2} = x$	11:5 $x+4 = x(x-2)$ $x+4 = x^2-2x$ $x^2-3x-4=0$ $(x-4)(x+1)=0$ $x=4$ or -1	15. Write down the equation of the tangent at (2,3) on the circle $x^2+y^2 = 13$	11:18 $m_{\text{radius}} = (3-0)/(2-0) = 3/2$ $m_{\text{tangent}} = -2/3$ Equation of tangent: $y = -2/3x + c$ $(2,3): 3 = -2/3(2) + c$; $c = 13/3$ Equation of tangent: $y = -2/3x + 13/3$ or $2x + 3y = 13$		

6. If $f(x) = 3x - 2$, find $f^{-1}(x)$

11:7

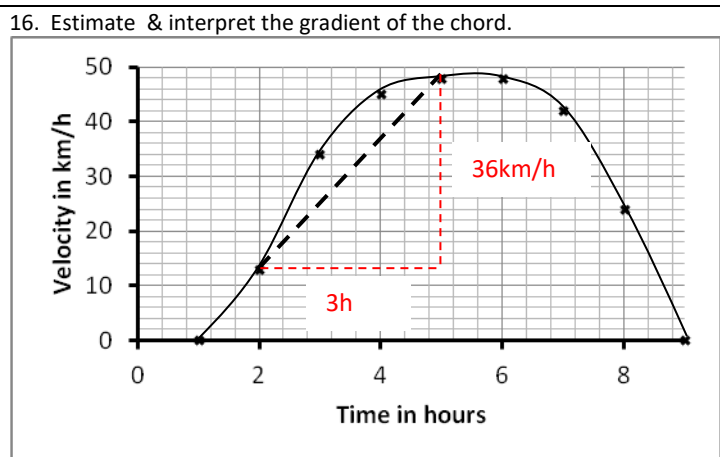
$$f^{-1}(x) = \frac{x + 2}{3}$$

7. Find the turning point of:
 $y = x^2 + 4x + 1$

11:8

$$(x+2)^2 - 4 + 1 = (x+2)^2 - 3$$

 $(-2, -3)$



11:20
 Average acceleration of 12km/h^2 between 2 & 5 hours

24. If $\vec{AB} = \mathbf{a}$ and $\vec{CB} = 3\mathbf{b}$
 Express \vec{CA} in terms of \mathbf{a} and \mathbf{b}

11:29

$$\vec{CA} = \vec{CB} + \vec{BA}$$

$$= 3\mathbf{b} - \mathbf{a}$$

8. Solve by completing the square:
 $x^2 + 8x - 9 = 0$

11:9

$$(x+4)^2 - 16 - 9 = 0$$

$$(x+4)^2 = 25$$

$$(x+4) = \pm 5$$

$$x = +5 - 4 \text{ or } -5 - 4$$

 $x = 1 \text{ or } -9$

17. $x^3 - 4x + 1 = 0$ can be solved using the iteration formula:

$$x_{n+1} = \sqrt[3]{4x_n - 1}$$

 Start with $x_1 = 2$ and work out an approximation for x by finding x_5 (to 2dp)

11:21
1.86

18. Work out the angle 'x' given the area of this triangle is 30cm^2 . (Correct to nearest whole degree)

11:22
 56°
 $30 = 0.5 \times 8 \times 9 \times \sin x$
 $\sin x = 30 \div (0.5 \times 8 \times 9)$
 $\sin x = 0.8333333\dots$

25. Use the table to complete the histogram:

11:30

Length (x) min	f	Fd
$0 < x \leq 5$	4	0.8
$5 < x \leq 15$	10	1
$15 < x \leq 30$	24	1.6
$30 < x \leq 40$	20	2
$40 < x \leq 45$	6	1.2

9. To solve: $5x^2 + 2x - 2 = 0$ by formula. Give answers in surd form.

11:10

$$-2 \pm \sqrt{44}$$

10

19. O is the centre. Work out angle x.

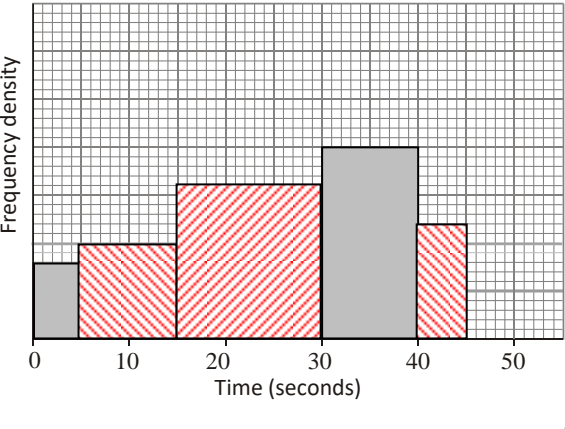
11:23
 46°

10. Write down the solution set for: $(x + 2)(x - 3) > 0$

11:11
 $\{x: x < -2 \text{ or } x > 3\}$

20. Work out the diagonal length of this cuboid. (1dp)

11:24
 $\sqrt{83}$
 $= 9.1\text{cm}$



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

Total (B)
 R (0-9)

Total (C)
 Y (10-19)

Total (C)
 G (20-25)