Maths Key Skills **Stage 11: Skill Check 13 Answers**

Name: ..... Date: ..... Class/Group: .....

A: Number & Algebra

1. Write **√50+√18** in the form k√2 — *11:1* **8√2**

2. Rationalise the denominator & simplify: $\frac{4}{2-\sqrt{2}}$ — *11:2* **$4+2\sqrt{2}$**

$\frac{4}{2-\sqrt{2}} \times \frac{2+\sqrt{2}}{2+\sqrt{2}}$
$= \frac{8+4\sqrt{2}}{2}$
$= 4+2\sqrt{2}$

3. A sack contains 20kg of chicken pellets (to nearest kg).Each day the chickens are given 800g (to the nearest 10g). Work out the maximum number of days the pellets last?(to nearest day) — *11:3* 20500÷795 =**26**

4. Simplify the following fraction: $\frac{x+3}{x^2-4x} \times \frac{x}{(x+3)^2}$ — *11:4*

$\frac{x+3}{x(x-4)} \times \frac{x}{(x+3)(x+3)}$
$\frac{1}{(x-4)(x+3)}$

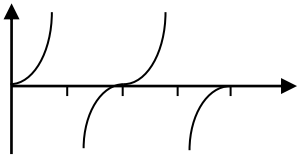
5. Solve: $\frac{x-1}{x+3} = x$ — *11:5* **x=-1**

x-1=x²+3x
x²+2x+1=0
(x+1)(x+1)=0
x=-1

B: Algebra, Proportion, Geometry & Measure

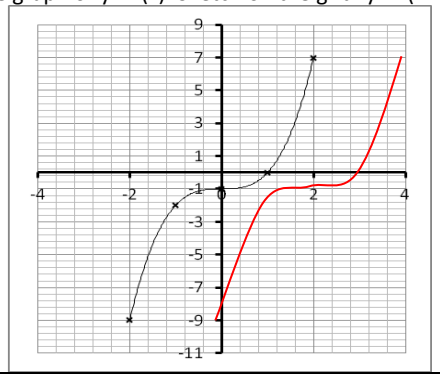
11. Make (**t**) the new subject of : $S = \sqrt{\frac{t^2-3}{4}}$ — *11:13* $t = \sqrt{4s^2+3}$

12. This is the graph of y = tanx
Give TWO solutions for **tan x = 0**



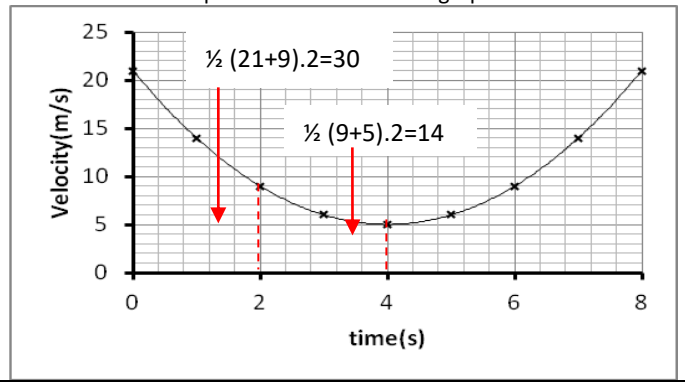
11:14 **0^0 180^0 360^0 any two**

13. This is the graph of y = f(x). Sketch on the grid: y = f(x-2)



11:15

14. Estimate & interpret the area under the graph.



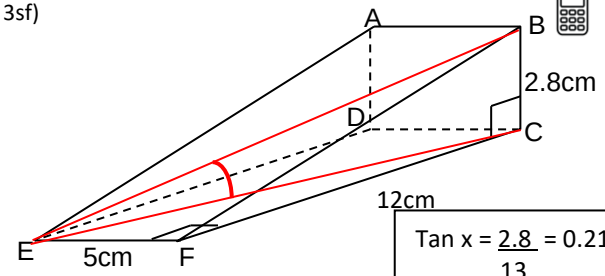
11:16 2(30+14) =88m Total distance or displacement

15. Write down the equation of the tangent at (5,4) on the circle with centre (2,1) — *11:18*

m_{radius} = (4-1)÷(5-2)= **1** $m_{tangent}$= **-1**
Equation of tangent: y = -x+c
(5,4): 4 = -1 (5)+c; c = 9
Equation: **y = -x +9 or y=9-x**

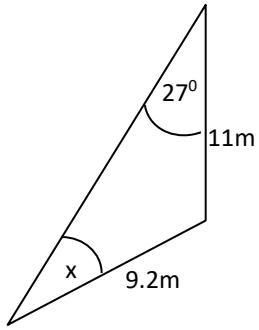
C: Geometry & Measure & Statistics

21. Work out the angle BE makes with the base (correct to 3sf) — *11:26* *CE=13 Tan = 2.8/13* **12.2^0**



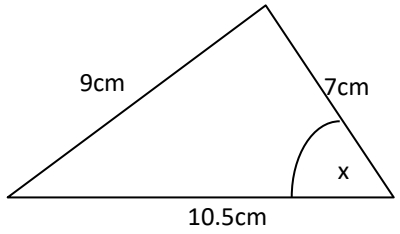
Tan x = 2.8/13 = 0.215...

22. Find the angle 'x'? (1dp) — *11:27* **32.9^0**



$\frac{\sin x}{11} = \frac{\sin 27}{9.2}$
$\sin x = \frac{11 \sin 27}{9.2}$
sinx = 0.542...
x = 32.9^0

23. Find the angle 'x'? (3sf) — *11:28* 57.8^0



$\cos x = \frac{7^2+10.5^2-9^2}{2(7)(10.5)}$
cos x = 0.53...
x = 57.8^0

6. If f(x) = 7-3x
find $f^{-1}(x)$

11:7

$\frac{7-x}{3}$

7. Find the turning point of:
$y= x^2 - 10x +11$

11:8

(5, -14)

$(x-5)^2 -25 + 11$
$(x-5)^2 - 14$
(5, -14)

8. Solve by completing the square: $2x^2 + 8x - 12 = 0$
(Write down the EXACT values)

11:9

$x=-2+\sqrt{10}$ or $-2-\sqrt{10}$

$x^2+4x-6=0$
$(x+2)^2 -4-6=0$
$x+2=\pm\sqrt{10}$
$x=-2+\sqrt{10}$ or $-2-\sqrt{10}$

9. To solve: **$3x^2 -6x =5$** by formula. Give answers in surd form.

11:10

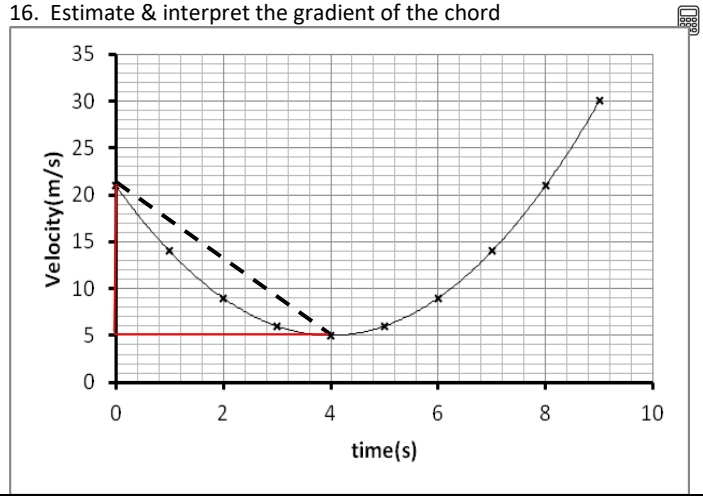
$\frac{6 \pm \sqrt{96}}{6}$

10. Write down the solution set for: $(x-4)(x+3) \geq 0$

11:11

{x: x≥4 or x≤-3}

16. Estimate & interpret the gradient of the chord



11:20

Average deceleration of $4m/s^2$ over 0-4s

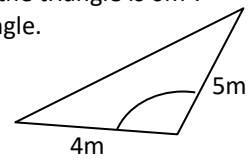
17. $x^2 - 5x - 3 = 0$ can be solved using the iteration formula: $x_{n+1} = \sqrt{5x_n + 3}$ Correct to 2dp

Start with **$x_1 = 5$** & work out an approximation for x by finding **x_5**

11:21

5.53

18. The area of the triangle is $6m^2$.
Work out the angle.
(Correct to 3sf)

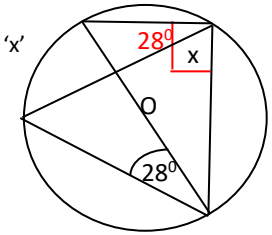


6=0.5x4x5xsinx
Sinx = 6÷(o.5x4x5) = 0.6

11:22

36.9^0

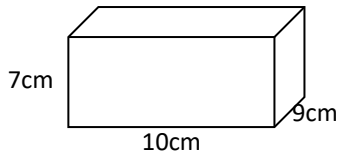
19. O is the centre.
Find the size of angle 'x'



11:23

90-28
$=62^0$

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



11:24

$\sqrt{(7^2+10^2+9^2)}$
=15.2cm

24.
Simplify: $\overrightarrow{AB} = -\frac{2}{3}(a - b) + 2b$

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

$= -\frac{2}{3}a + \frac{8}{3}b$

$= \frac{2}{3}(4b - a)$

11:29

25. Complete the table for frequency density:

Scores	Frequency	Frequency density
$0 < n \leq 5$	8	1.6
$5 < n \leq 15$	12	1.2
$15 < n \leq 40$	20	0.8
$40 < n \leq 50$	10	1

11:30

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