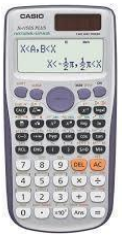
King's College
Saint Michaels

Preliminary Maths Test

Year 12/Foundation

Name: .....



Allowed ✓

1. Work out $\dfrac{(37+16)\times(41-19)}{54-17}$

(1 mark)

2. Work out $17^2 - 6^3$ =

(1 mark)

3. a.) What is 56 as a percentage of 91 (1 mark)

b.) Express 56 as a fraction of 91, in lowest terms (1 mark)

4. What is 45.7643 cm to the nearest cm. .....
to 3 significant figures. .....
to 3 decimal places. .....

(3 marks)

5. Find $\frac{3}{4} + \frac{2}{3} - \frac{5}{12} =$

(1 mark)

6. Simplify $3(a+b) - 5(a-2b)$ (2 marks)

7. Solve the equation $3x - 2 = 7$

.....

(1 mark)

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8. Decrease 50 by 20%

…….

(2 marks)

9. Solve the equations

$x + 2y = 7$

$2x - 5y = 5$

…… ……

(3 marks)

10. Simplify $(x + 2)(x - 3)$

……

(1 mark)

EXAMPLE: Factorise $3x + x^2 = x(3 + x)$

Factorise $x^2 - 5x + 6 =$ …….

(1 mark)

Factorise $4x^2 - 25 =$ …….

(1 mark)

Solve $\frac{x+5}{4} = \frac{3x}{2}$ ……

(1 mark)

Rearrange $a = 2(b - 3)$ to get $b =$ ☐ (1 mark)

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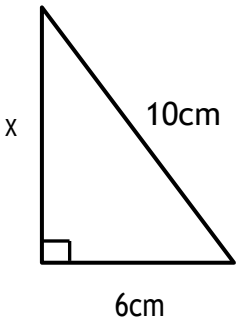
11. Find length x



.....

(1 mark)

12. How much drink does this can hold?

Cylinder: Radius = 4cm Height = 12cm

a.) in cm^3

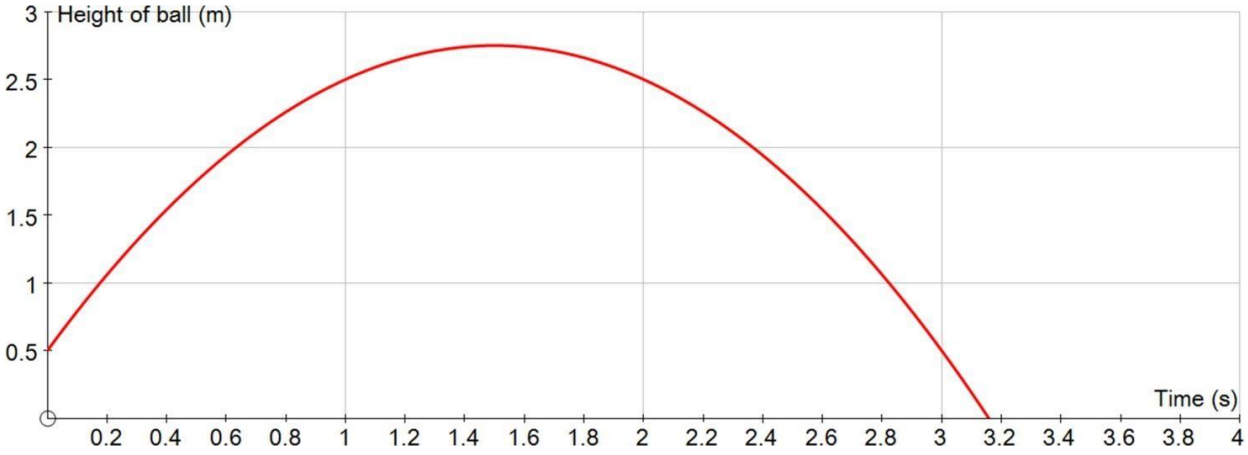
b.) in litres

(3 marks)

13. The graph shows a ball being thrown in the air. When is the height of the ball 2m?

.....

(2 marks)



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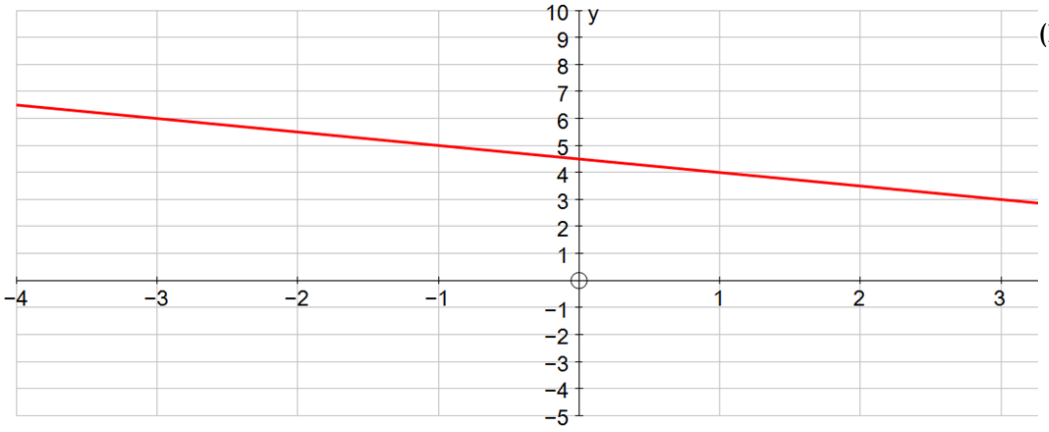


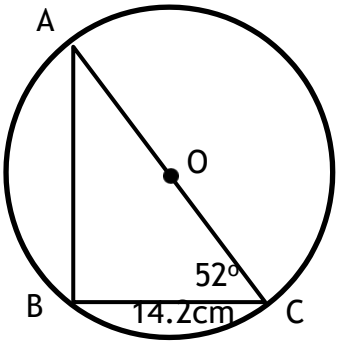
(2 marks)

14. The axes above show the equation of $2y + x = 9$. Plot the graph of $y = 2x + 2$ on the same axes.

Solve the simultaneous equations $2y + x = 9$ and $y = 2x + 2$

= ..... = ... (1 mark)

14. A , B and C are points on the circumference of a circle with centre O.



(Not to scale)

BC = 14.2 cm and angle ACB = 52°

Calculate the circumference of the circle.
Give your answer to 3 significant figures.

..... (4 marks)

15. Find the gradient of the straight line passing through the points

(1 , 6) and (5 , -2) .....

(2 marks)

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17. Simplify $(8p^9)^{\frac{1}{3}}$ ..... (2 marks)

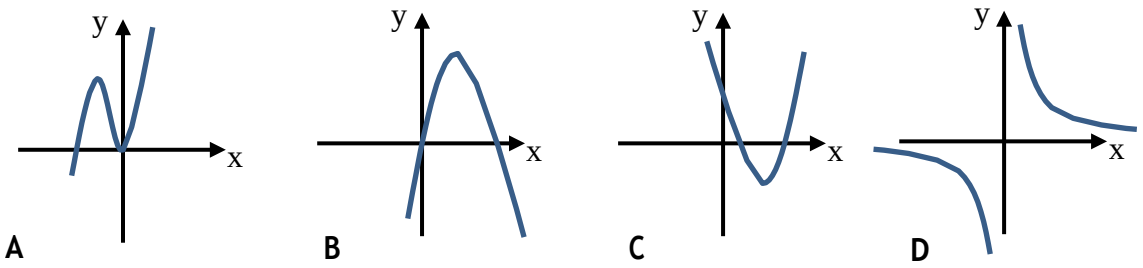
Simplify $(\sqrt{2}+3)(\sqrt{2}-5)$

..... (2marks)

Solve $2x^2 + x - 3 = 0$

.... (2marks)

18.



i.) Which equation matches each curve sketch? (there is an extra equation)

$y = 4x - x^2$, $y = \frac{1}{x}$, $y = x^2 - 4x + 3$, $y = x^3 + 2x^2$, $y = -x^2 + 4$

(2 marks)

ii.) Find the gradient of $y = x^2 - 4x + 3$ at the point where $x = 3$

(2 marks)

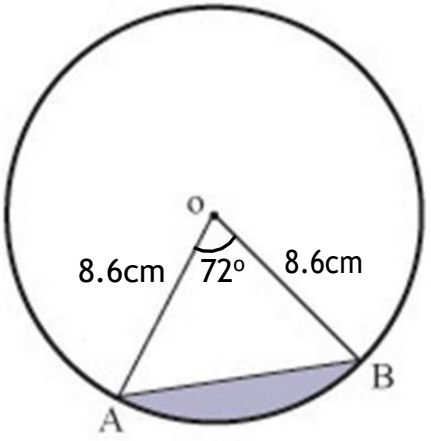
19. The diagram shows a sector of a circle centre 0, AB is a chord.

0A = 0B = 8.6cm angle AOB = 72°

Calculate the area of the shaded segment.

Give your answer <u>with units</u> correct

to 3 significant figures.



..... (4 marks)