ST EDWARD'S

OXFORD

14+ ENTRANCE EXAMINATION

For entry in

September 2016

Mathematics

Time: 1 hour

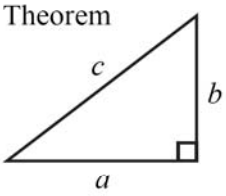
Candidate's Name: ……

Instructions to Candidates

- 60 Marks
- Time allowed 1 Hour
- Calculators are allowed
- Write all answers, including your workings, in this booklet

IGCSE MATHEMATICS 4400
FORMULA SHEET – HIGHER TIER

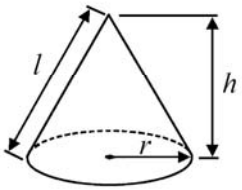
Pythagoras' Theorem



$a^2 + b^2 = c^2$

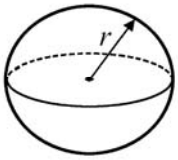
Volume of cone = $\frac{1}{3}\pi r^2 h$

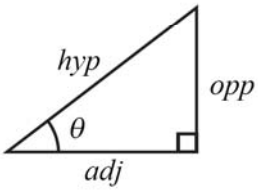
Curved surface area of cone = $\pi r l$



Volume of sphere = $\frac{4}{3}\pi r^3$

Surface area of sphere = $4\pi r^2$





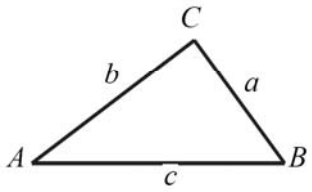
adj = hyp × cos θ
opp = hyp × sin θ
opp = adj × tan θ

or $\sin\theta = \frac{\text{opp}}{\text{hyp}}$

$\cos\theta = \frac{\text{adj}}{\text{hyp}}$

$\tan\theta = \frac{\text{opp}}{\text{adj}}$

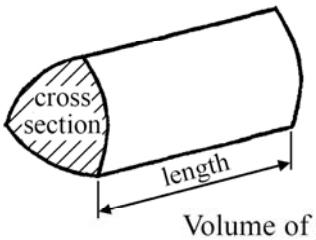
In any triangle ABC



Sine rule $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

Cosine rule $a^2 = b^2 + c^2 - 2bc\cos A$

Area of triangle = $\frac{1}{2}ab\sin C$



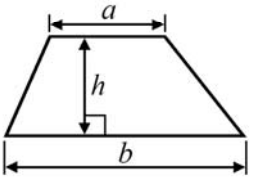
Volume of prism = area of cross section × length

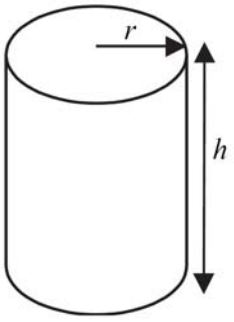


Circumference of circle = $2\pi r$

Area of circle = πr^2

Area of a trapezium = $\frac{1}{2}(a+b)h$





Volume of cylinder = $\pi r^2 h$

Curved surface area of cylinder = $2\pi rh$

The Quadratic Equation
The solutions of $ax^2 + bx + c = 0$ where $a \neq 0$, are given by

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

1. William's salary is £24 000
His salary increases by 4%.

Work out William's new salary.

£ .....

(Total 2 marks)

2. Ann buys a dress in a sale.
The normal price of the dress is reduced by 20%.
The normal price is £36.80

Work out the sale price of the dress.

£ .....

(Total 3 marks)

3. (a) Find the Highest Common Factor of 75 and 90.

……

(2)

(b) Find the Lowest Common Multiple of 75 and 90.

……

(2)
(Total 4 marks)

4. Ann and Bob shared £240 in the ratio 3 : 5

Ann gave a **half** of her share to Colin.
Bob gave a **tenth** of his share to Colin.

What fraction of the £240 did Colin receive?

.....

(Total 4 marks)

5. (a) Solve $7p + 2 = 5p + 8$

$p =$ .....

(2)

(b) Solve $7r + 2 = 5(r - 4)$

$r =$ .....

(2)

(Total 4 marks)

6.

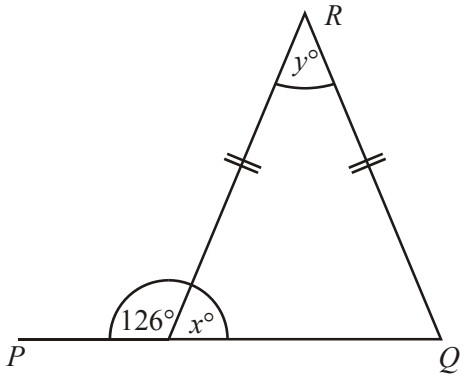


Diagram **NOT** accurately drawn

PQ is a straight line.

(a) Work out the size of the angle marked $x°$.

.....°

(1)

(b) (i) Work out the size of the angle marked $y°$.

.....°

(ii) Give reasons for your answer.

.....

.....

(3)

(Total 4 marks)

7.

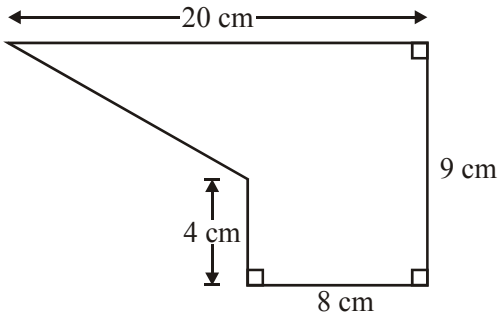


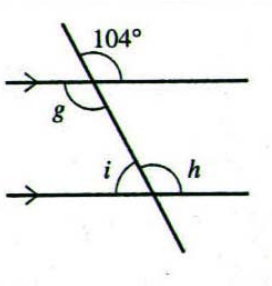
Diagram **NOT** accurately drawn

The diagram shows a shape.
Work out the area of the shape.

Area = ……..cm^2 **(3 marks)**

8. Find the missing Angles

a)

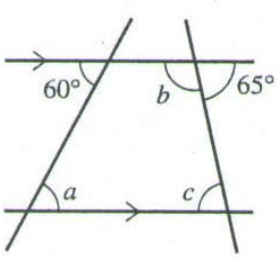


g=……

h=……...

i=……

b)



a=……

b=……...

c=……

(6 marks)

9. A straight line has equation $y = 5 - 3x$

(a) Write down the gradient of the line.

……..

(1)

(b) Write down the coordinates of the point where the line crosses the y axis.

(…… , ……)

(1)

(Total 2 marks)

10. Solve the simultaneous equations

$$2x + y = 4$$

$$5x - y = 17$$

x = …….

y = …….

(Total 2 marks)

11. (a) Solve $20y - 16 = 18y - 9$

y = ...

(3)

(b) Solve $\dfrac{40 - x}{3} = 4 + x$

x = ...

(3)

(Total 6 marks)

12.

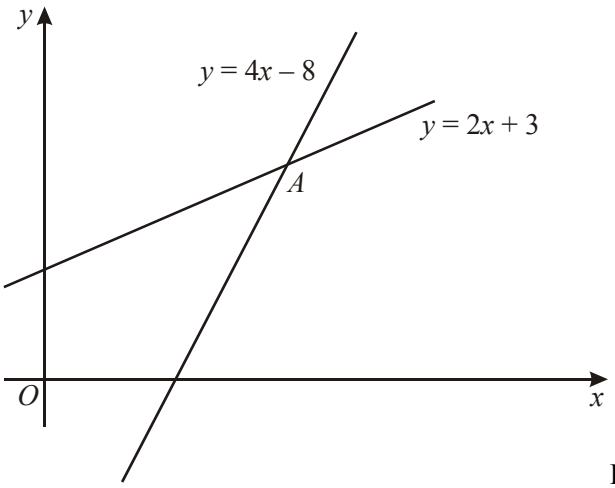


Diagram **NOT** accurately drawn

The diagram shows two straight lines intersecting at point A.
The equations of the lines are

$y = 4x - 8$
$y = 2x + 3$

Work out the coordinates of A.

(....., ...)

(Total 3 marks)

13. (i) Factorise $x^2 - 7x + 12$

.....

(ii) Solve the equation

$$x^2 - 7x + 12 = 0$$

.....

(Total 3 marks)

14. Solve

$$\frac{x}{3} - 5 = 3(x - 2)$$

$x =$ ……

(Total 4 marks)

15. a) Factorise

i) $2x^2 - 7x + 3$

..... [2 marks]

ii) $4x^2 - 9$

..... [2 marks]

16. Ben fills a container with boxes.
Each box is a cube of side 0.5 m.

The container is a cuboid of
length 9 m,
width 4 m and
height 3 m.

Work out how many boxes will fit exactly into the container.

……
(Total 3 marks)

17. I bought a cat and a dog, and then sold them for £60 each. I made a 20% profit on the dog and a 20% loss on the sale of the cat. How much money did I make (or lose)?

……
(Total 3 marks)