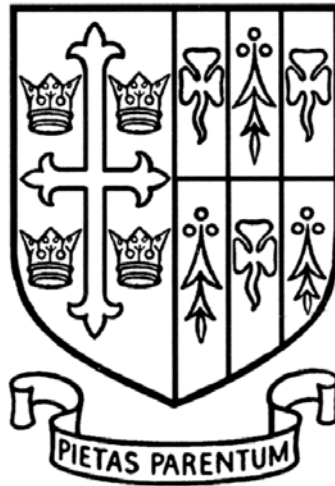


ST EDWARD'S
OXFORD



13+ SCHOLARSHIP EXAMINATION
2010

MATHEMATICS
PAPER I

1 hour

Answer all questions.

Calculators are permitted.

Name: _____

1. Lisa used $\frac{1}{2}$ of her lottery win to buy a house.

She gave $\frac{1}{6}$ of her lottery win to a charity.

Lisa then shared the remainder of her lottery win equally between her four children.
Work out the fraction of Lisa's lottery win that **each** of her four children received.

.....
(Total 4 marks)

2. (a) Simplify

(i) $3a + 4b - 2a - b$

(ii) $5x^2 + 2x - 3x^2 - x$

.....

.....

(4)

(b) Expand the brackets

(i) $4(2x - 3)$

(ii) $p(q - p^2)$

.....

.....

(2)

(c) Expand and simplify $5(3p + 2) - 2(5p - 3)$

.....

(2)

(Total 8 marks)

3. The fraction, p , of an adult's dose of medicine which should be given to a child who weighs w kg is given by the formula

$$p = \frac{3w + 20}{200}$$

A child weighs 35 kg.

- (a) Work out the fraction of an adult's dose which should be given to this child.
Give your answer as a fraction in its simplest form.

..... (2)

- (b) Use the formula $p = \frac{3w + 20}{200}$ to find the weight of a child whose dose is the same as an adult's dose.

..... kg (3)
(Total 5 marks)

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

$p =$ (2)

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

$r =$ (2)
(Total 4 marks)

5. The first term of a sequence is 7.
The rule for the sequence is **Add 5 to the previous term.**

- (a) Write down the second term and the third term of the sequence.

....., (1)

- (b) Work out the 10th term of the sequence.

..... (2)

- (c) Write down an expression, in terms of n , for the n th term of the sequence.

..... (2)
(Total 5 marks)

6. 20 students took a short test.
The table gives information about their marks in the test.

Mark	Frequency	
7	1	
8	5	
9	7	
10	9	

Work out the mean mark.

.....
(Total 3 marks)

7. 80 students each study one of three languages.
The two-way table shows some information about these students.

	French	German	Spanish	Total
Female	15			39
Male		17		41
Total	31	28		80

- (a) Complete the two-way table. (2)

One of these students is to be picked at random.
(b) Write down the probability that the student picked studies French.

.....
(1)
(Total 3 marks)

- 8.

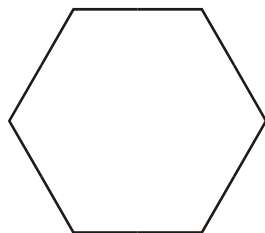


Diagram **NOT** accurately drawn

Calculate the size of the exterior angle of a regular hexagon.

.....°
(Total 2 marks)

9. Solve

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

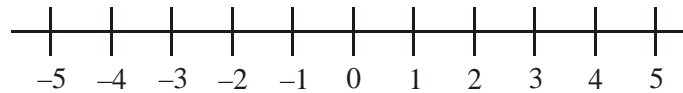
$x = \dots\dots\dots$

(Total 4 marks)

10. (a) (i) Solve the inequality

$$5x - 7 < 2x - 1$$

(ii) On the number line, represent the solution set to part (i).



(3)

n is an integer such that $-4 \leq 2n < 3$.

(b) Write down the possible values of n .

$\dots\dots\dots$

(3)

(Total 6 marks)

11.

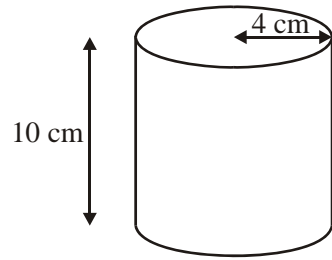


Diagram **NOT** accurately drawn

The diagram shows a cylinder with a height of 10 cm and a radius of 4 cm.

- (a) Calculate the volume of the cylinder.
Give your answer correct to 3 significant figures.

.....cm³ (2)

The length of a pencil is 13 cm.
The pencil cannot be broken.

- (b) Show that this pencil cannot fit inside the cylinder.

(3)
(Total 5 marks)

12.

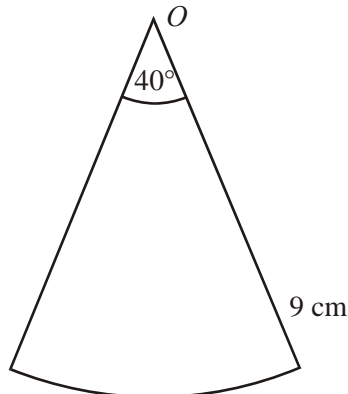


Diagram **NOT** accurately drawn

The diagram shows a sector of a circle, centre O .
The radius of the circle is 9 cm.
The angle at the centre of the circle is 40° .
Find the perimeter of the sector.
Leave your answer in terms of π .

.....cm
(Total 4 marks)

13.

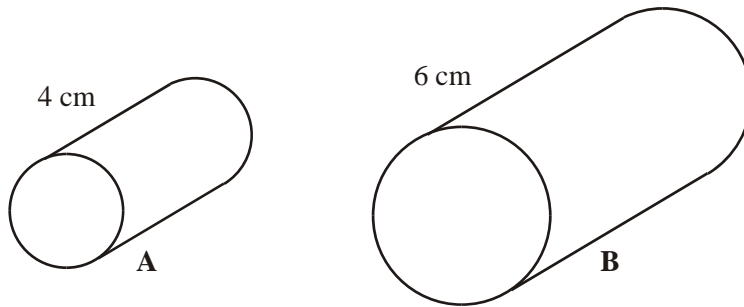


Diagram **NOT** accurately drawn

Cylinder **A** and cylinder **B** are mathematically similar.
The length of cylinder **A** is 4 cm and the length of cylinder **B** is 6 cm.
The volume of cylinder **A** is 80 cm^3 .
Calculate the volume of cylinder **B**.

..... cm^3
(Total 3 marks)

14. Solve the simultaneous equations

$$3x - 4y = 11$$

$$5x + 6y = 12$$

$x =$
 $y =$
(Total 4 marks)