

JUNIOR LYCEUMS ANNUAL EXAMINATIONS - 2002

Educational Assessment Unit - Education Division

FORM III MATHEMATICS (NON CALCULATOR PAPER) TIME: 10 minutes

Name _____

Class _____

Mark

ANSWER ALL QUESTIONS. THERE ARE 10 QUESTIONS TO ANSWER.

EACH QUESTION CARRIES 1 MARK.

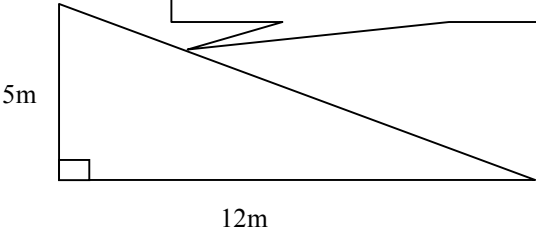
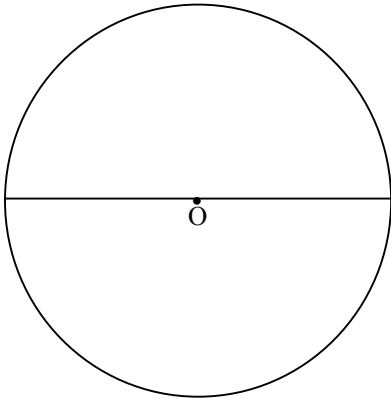
CALCULATORS, RULERS, PROTRACTORS AND OTHER MATHEMATICAL INSTRUMENTS ARE NOT ALLOWED.

ON YOUR DESK YOU SHOULD HAVE NOTHING EXCEPT FOR PEN, PENCIL AND THE EXAMINATION PAPER.

TO ANSWER QUESTIONS INVOLVING NUMERICAL CALCULATIONS YOU ARE ADVISED TO CHOOSE AND USE THE MORE EFFICIENT TECHNIQUES (MENTAL OR PENCIL-AND-PAPER).

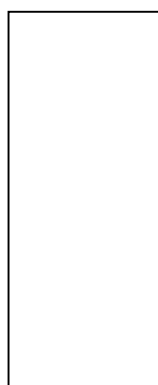
YOU ARE NOT REQUIRED TO SHOW YOUR WORKING. HOWEVER SPACE FOR WORKING IS PROVIDED IF YOU NEED IT.

**DO NOT
WRITE
IN
THIS
SPACE**

QUESTION	SPACE FOR WORKING IF REQUIRED.
1. How much is one-fifth of fifteen added to one-tenth of twenty? Ans _____	
2. Write down the mean of $-5, 4, -4, 5, 5$. Ans _____	
3. Write down the value of $\frac{25 \times 36 \times 100}{50 \times 9 \times 4 \times 10}$. Ans _____	
4. A bank offers 5% per annum interest. How much interest is paid on Lm2000 in one year? Ans _____	
5. How long is this side? (The sketch is not drawn to scale.)  12m Ans _____	
6. The probability that tomorrow it will rain is $\frac{1}{8}$. What is the probability that tomorrow it will not rain? Ans _____	
7. In this figure O is the centre of the circle. Give an estimate for the circumference of the circle.  Ans _____	

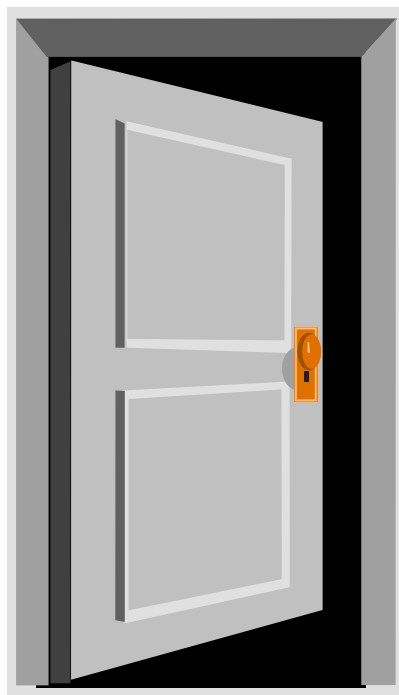
8. The rectangle is a scale drawing of the door. What scale is used? Write your answer in the form $1 : n$.

Sketch of door



2cm

5cm



1m

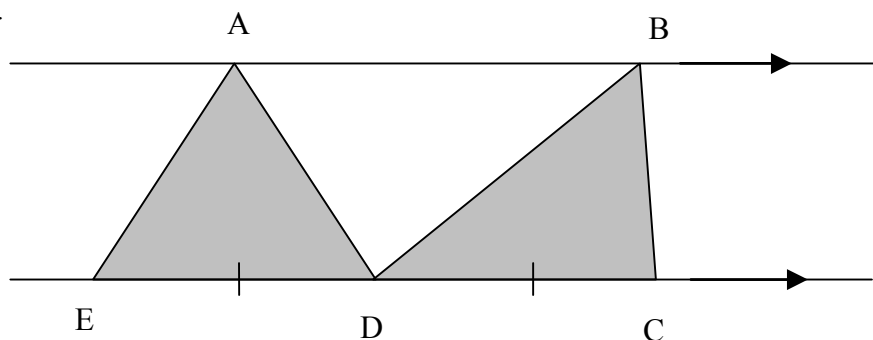
2.5m

Ans _____

9. A field of grass feeds 48 cows for 12 days. How long would the same field feed 36 cows?

Ans _____

10.



In the figure $ED = DC$. Which statement is true?

- A. The area of quadrilateral ABDE is **equal** to the area of quadrilateral ABCD .
- B. The area of quadrilateral ABDE is **greater** than the area of quadrilateral ABCD .
- C. The area of quadrilateral ABDE is **smaller** than the area of quadrilateral ABCD .
- D. Cannot tell.

Ans _____

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FORM 3

MATHEMATICS (Main Paper)

TIME: 1 h 50 min

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total Main	Non Calculator Paper	Global Mark
Mark																		

DO NOT WRITE ABOVE THIS LINE

Name _____

Class _____

CALCULATORS ARE ALLOWED BUT ALL NECESSARY WORKING MUST BE SHOWN

ANSWER ALL QUESTIONS.

1. a. Express 0.35 as a fraction in its **lowest terms**.

Ans: _____

b. Express $\frac{1}{14}$ as a decimal correct to **three significant figures**.

Ans: _____

c. Arrange the following in **descending** order:

$\frac{2}{3}$, 0.6, 0.66, $\frac{6}{100}$.

Ans: _____

d. Write the value of $\left(\frac{2}{7}\right)^{-1}$ as a **mixed number**.

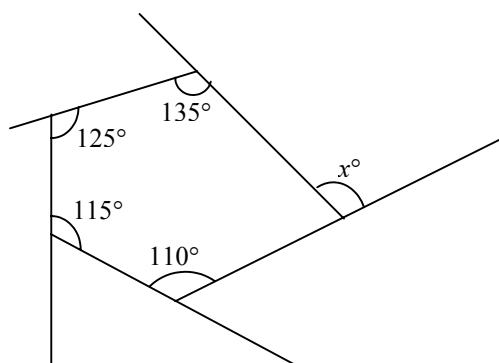
Ans: _____

(4marks)

2. a. The exterior angle of a regular polygon is 40° . How many sides does this polygon have?

Ans: _____

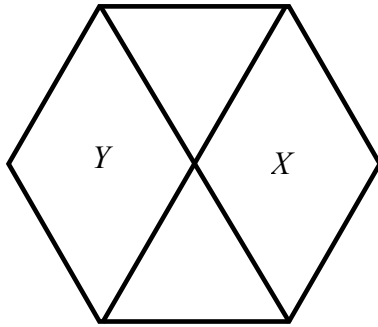
b. Work out the size of the angle marked x° in the figure.



Ans: _____

(4 marks)

3.



The figure shows a **regular hexagon**.

i. What fraction of the hexagon is the *area X*?

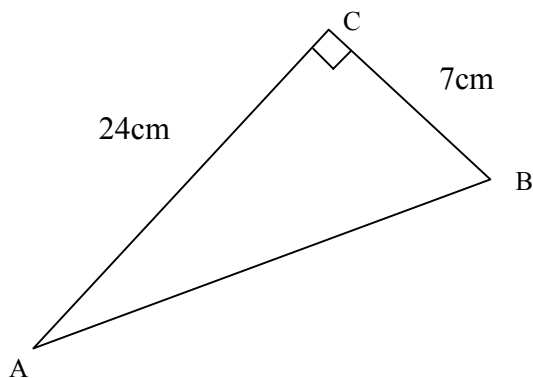
Ans: _____

ii. Express the fraction $\frac{\text{Area } X + \text{Area } Y}{\text{Area of whole hexagon}}$ as a percentage.

Ans: _____

(4marks)

4.



Triangle ABC is right-angled at C.

a. Which side is opposite to angle A?

b. _____ Which is the longest side of the triangle ABC?

c. Work out the size of angle B correct to one decimal place.

Ans: _____

(4marks)

5. 4.5 litres of petrol cost Lm1.44. My car travels 10 km on one litre of petrol.

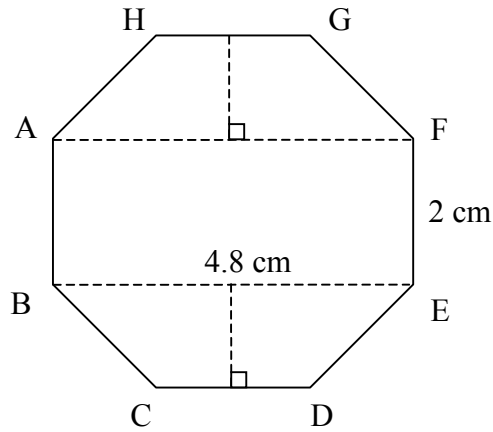
a. How many litres of petrol do I need to travel a distance of 120km?

Ans: _____

b. Work out the cost for this journey.

Ans: Lm _____.

(4marks)



Giving your answers correct to one decimal place,

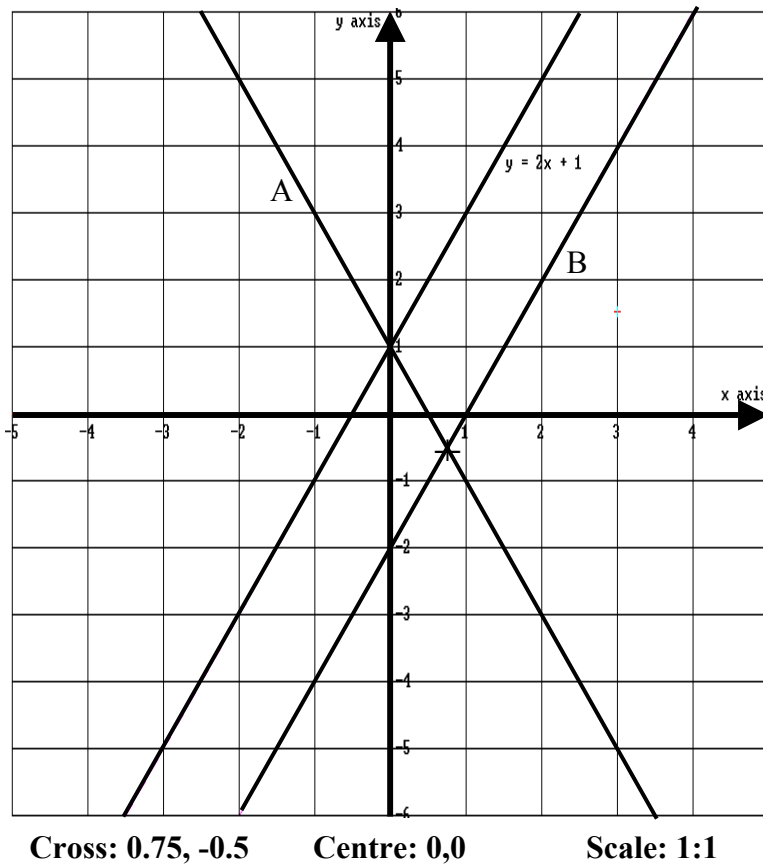
- a. calculate the distance between the parallel sides AF and GH of the trapezium AFGH;

Ans: _____

- b. work out the area of the trapezium AFGH.

Ans: _____ (6marks)

9.



From the graph answer the following questions:

- a. The equation of the line A is _____.

- b. The co-ordinates of the point of intersection of the lines A and B are (,).

- c. The solution of the simultaneous equations $y = 2x + 1$ and the equation of the line labelled A is $x =$ _____
 $y =$ _____

Cross: 0.75, -0.5

Centre: 0,0

Scale: 1:1

(6marks)

10. a. Given that $p = q + \frac{2r}{5}$,
- i. work out the value of p when $q = 6$ and $r = 10$,

Ans: _____

- ii. make r the subject of the formula.

Ans: _____

b.



The rectangle is a scale drawing of a field and is drawn using a scale of 1:1000.

Work out the true length of **one diagonal** correct to the **nearest metre**.

Ans: _____

(6marks)

11. a. Write down the **least common multiple** of 2, 4, 3 .

Ans: _____

- b. Factorise the expressions:

(i) $3x - 6$

Ans: _____

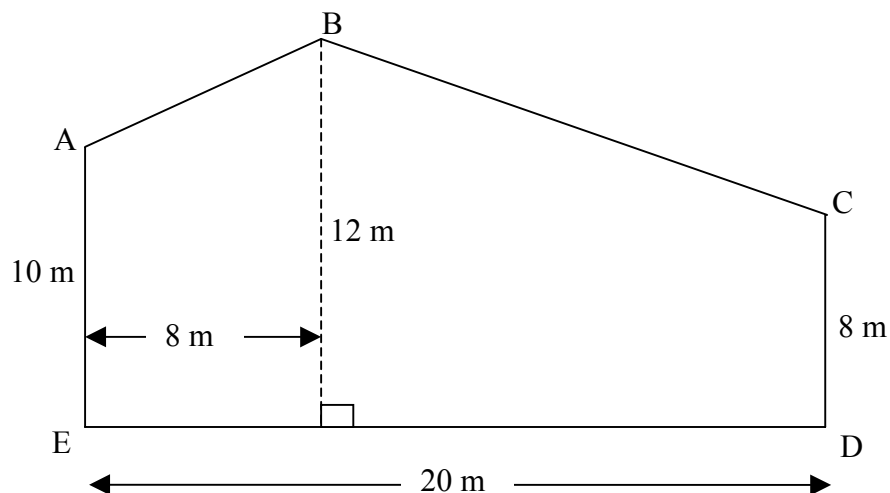
(ii) $8x - 12$

Ans: _____

c. Simplify : $\frac{x}{2} - \frac{3x-6}{4} + \frac{8x-12}{6}$

Ans: _____

(8marks)



12.

The diagram shows the cross-section of a workshop. ED is horizontal. AE and CD are vertical.

Work out, correct to 3 significant figures :

i. the length of AB;

Ans: _____

ii. the length of BC;

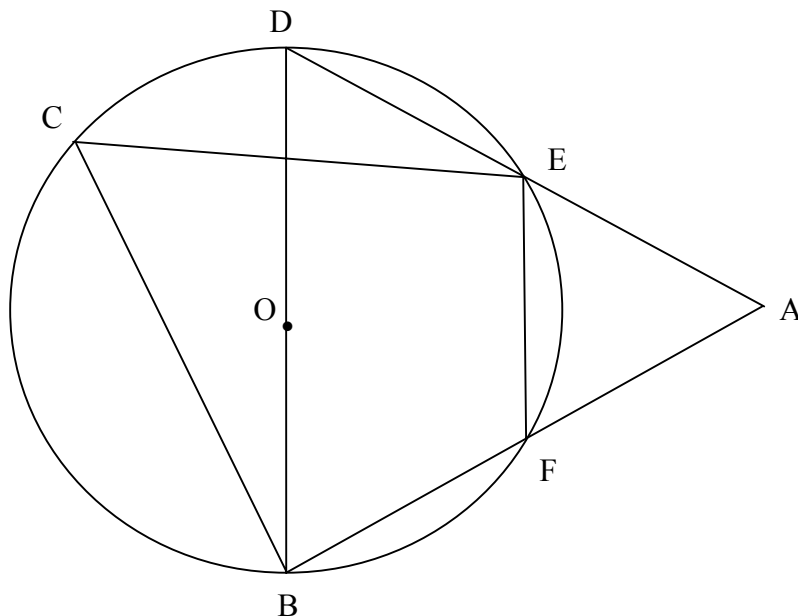
Ans: _____

iii. the angle CB makes with the horizontal, correct to the nearest degree.

Ans: _____

(8marks)

13.



In the figure $AD = AB$ and BD is a diameter. The angle $ABD = 65^\circ$. Write down, giving reasons for your answer, the size of :

a. $\angle BDA = \underline{\hspace{2cm}}$ ()

b. $\angle BCE = \underline{\hspace{2cm}}$ ()

c. $\angle EFB = \underline{\hspace{2cm}}$ ()

d. From the above, or otherwise, explain why the lines BD and EF are parallel.

(8marks)

14. (a) Complete the table for $y = 5 + x - x^2$ for values of x from -3 to 4 .

x	-3	-2	-1	0	1	2	3	4
5	5		5	5	5		5	5
$+x$	-3		-1	0	1		3	4
$-x^2$	-9		-1	0	-1		-9	-16
y	-7		3	5	5		-1	-7

(b) Draw the graph of $y = 5 + x - x^2$. Take 2cm to represent 1 unit on both axes.

(c) From your graph write down the largest value of y and the corresponding value of x .

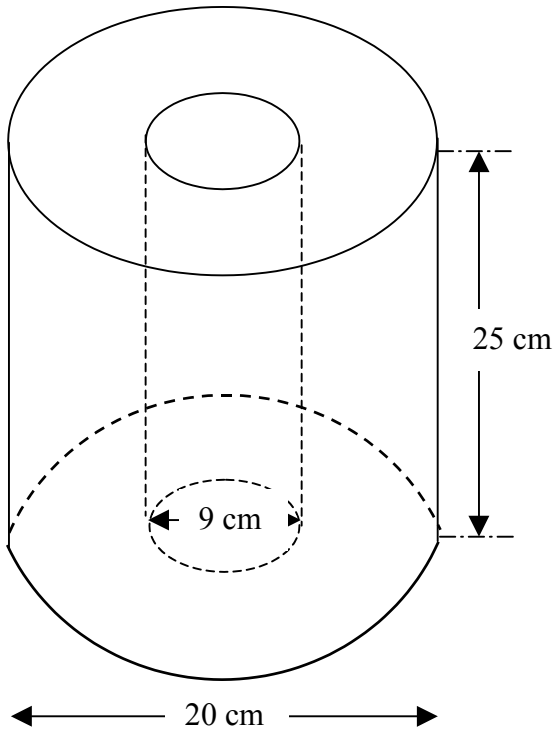
Ans: $x = \underline{\hspace{2cm}}$, $y = \underline{\hspace{2cm}}$.

(d) From your graph solve the equation $5 + x - x^2 = 3$.

Ans: $x = \underline{\hspace{2cm}}$, $x = \underline{\hspace{2cm}}$.

(8marks)

15. (In this question give your answer in cm correct to 2 significant figures.)



The diagram shows a solid cylinder with a hole drilled in it from end to end.

- a. Work out the area of the bottom surface of the solid.

Ans: _____ cm^2

- b. Work out the volume of metal in the solid.

Ans: _____ cm^3

- c. Work out the **total** surface area of the metal.

Ans: _____ cm^2

(8marks)

