

**JUNIOR LYCEUM ANNUAL EXAMINATIONS 2007**

Educational Assessment Unit – Education Division

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**FORM 3      MATHEMATICS (Non-Calculator Paper)      TIME: 10 minutes**

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Name: \_\_\_\_\_

Class: \_\_\_\_\_



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**INSTRUCTIONS TO CANDIDATES**

- Answer all questions. There are 10 questions to answer.
  - Each question carries 1 mark.
  - Calculators, protractors and other mathematical instruments except rulers are not allowed.
  - You are not required to show your working. However space for working is provided if you need it.
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No.	Question	Space for Working
1	Round 7,362,853 to the nearest thousand.  <b>Answer:</b> _____	
2	What fraction is equal to $0.\dot{3}$ ? <b>Answer:</b> _____	
3	Express 60 as the product of prime factors.  <b>Answer:</b> _____	
4	Factorise: $6a + 9$ .  <b>Answer:</b> _____	
5	Calculate the simple interest earned if Lm350 are invested at 4% per annum for 1 year.  <b>Answer:</b> _____	
6	Write 0.000777 in standard form. <b>Answer:</b> _____	
7	Peat for the garden is sold in 4 kg bags. Albert needs 23 kg of peat. How many bags must he buy? <b>Answer:</b> _____	
8	Expand: $y(2y - 3)$ .  <b>Answer:</b> _____	
9	$0.3 \times 0.4 = 1.2$ . True or False? <b>Answer:</b> _____	
10	What is the reciprocal of $1\frac{2}{3}$ ? <b>Answer:</b> _____	

# JUNIOR LYCEUM ANNUAL EXAMINATIONS 2007

Educational Assessment Unit – Education Division

**FORM 3**

**MATHEMATICS (Main Paper)**

**TIME: 1h 50min**

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total Main	Non Calculator	GLOBAL MARK

**DO NOT WRITE ABOVE THIS LINE**

Name: \_\_\_\_\_

Class: \_\_\_\_\_

**CALCULATORS ARE ALLOWED BUT ALL NECESSARY WORKING MUST BE SHOWN.  
ANSWER ALL QUESTIONS.**

1. Simplify:
- a)  $p^2 \times p^7 =$  \_\_\_\_\_
  - b)  $q^5 \div q^2 =$  \_\_\_\_\_
  - c)  $\frac{9a^5}{3a} =$  \_\_\_\_\_
  - d)  $(3x^{-2})^2 =$  \_\_\_\_\_

\_\_\_\_\_ (4 marks)

2. a) The mean of 15, 17,  $x$ , 28 and 19 is 16. What is the value of  $x$ ?

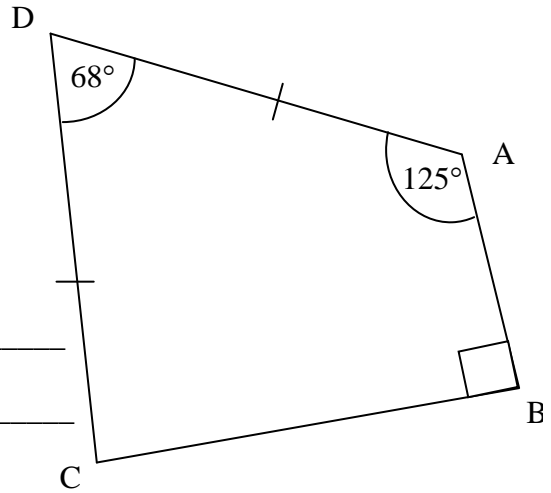
Answer  $x =$  \_\_\_\_\_

- b) A ball is dropped from a height of  $2\frac{1}{3}$  m. At each bounce, it bounces to  $\frac{3}{4}$  of the height from which it falls. Find the height after one bounce.

Answer \_\_\_\_\_

\_\_\_\_\_ (4 marks)

3. a) ABCD is a quadrilateral in which  $\angle ABC$  is a right angle and  $AD = DC$ . Calculate the size of  $\angle BCD$ .



$\angle BCD = \underline{\hspace{2cm}}^\circ$

Reason: \_\_\_\_\_

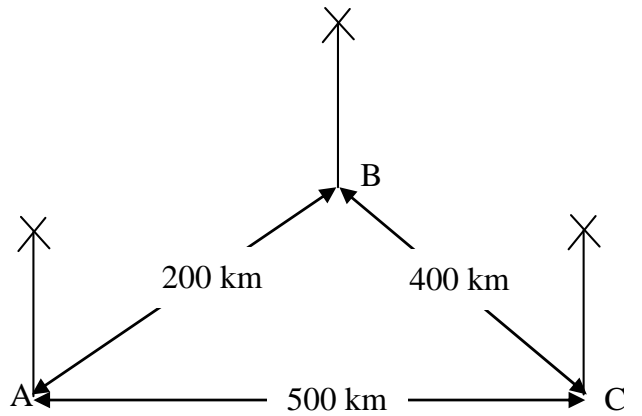
\_\_\_\_\_

- b) Join A to C. Calculate the size of  $\angle ACD$ . (Give reasons for your answers.)

$\angle ACD = \underline{\hspace{2cm}}^\circ$  Reason: \_\_\_\_\_

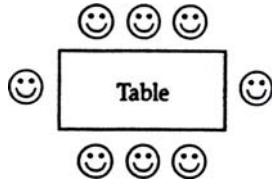
(4 marks)

4. The diagram shows three telephone posts. Using a scale of 1 cm to 50 km, construct a scale diagram of triangle ABC.

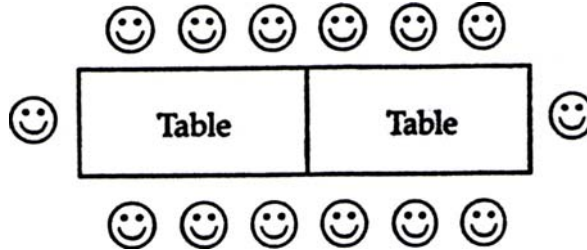


(4 marks)

5. At a party each table can seat a maximum of eight people.



Tables are put together to seat more people as shown below.



a) What is the maximum number of persons that can be seated if four tables are put together as shown above?

Answer a) \_\_\_\_\_

b) How many such tables placed together are required to seat 44 persons without leaving empty places?

Answer b) \_\_\_\_\_

(4 marks)

6. A shopkeeper buys 500 umbrellas for Lm800. She marks the selling price for each umbrella as Lm4.00.

a) What is the cost price of 1 umbrella?

Answer a) \_\_\_\_\_

b) What is the percentage increase from cost price to selling price?

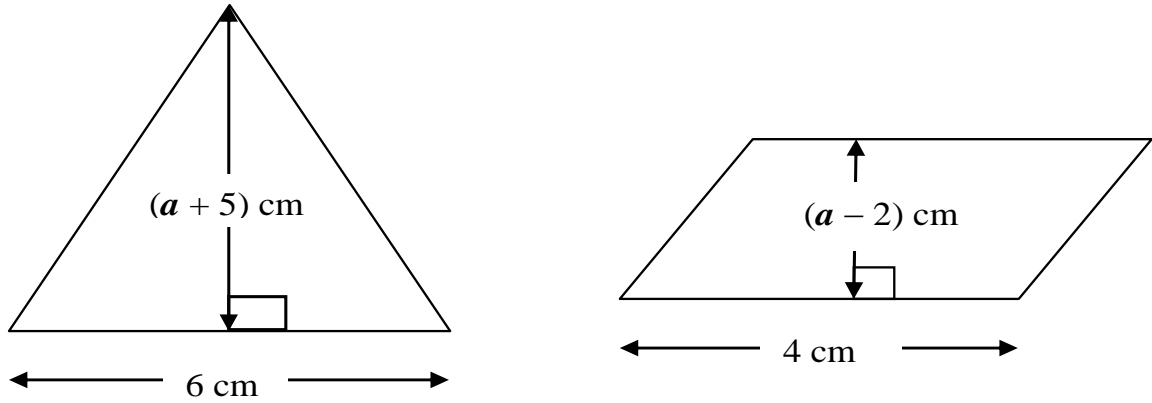
Answer b) \_\_\_\_\_

c) The shopkeeper sells all the umbrellas. What profit does she make?

Answer c) \_\_\_\_\_

(6 marks)

7. The triangle and the parallelogram shown below have the same area.



a) Write, in its simplest form, an expression for the area of the triangle.

Answer a) \_\_\_\_\_

b) Write an expression for the area of the parallelogram.

Answer b) \_\_\_\_\_

c) Using the fact that these areas are equal, find the value of  $a$ .

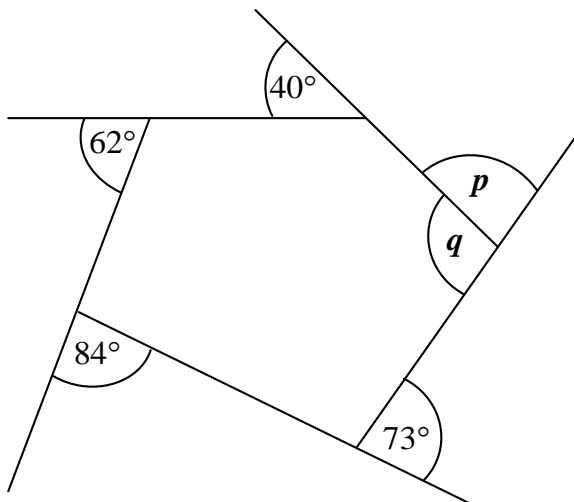
Answer c) \_\_\_\_\_

(6 marks)

8. a) Calculate the size of one interior angle of a regular polygon with 10 sides.

Answer a) \_\_\_\_\_

b) Calculate the value of  $p$  and  $q$  in the diagram.

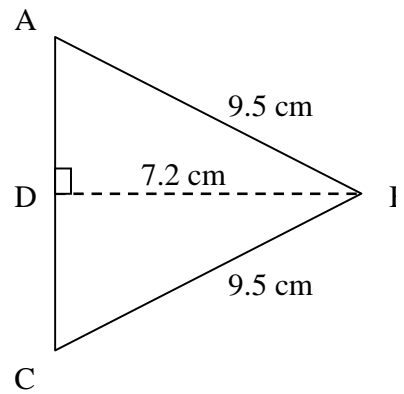


Answers b)  $p =$  \_\_\_\_\_

$q =$  \_\_\_\_\_

(6 marks)

9. An isosceles triangle ABC has  $AB = BC = 9.5$  cm.  
 The height, BD, of the triangle is 7.2 cm.  
 a) Work out the length of AC.  
 (Give your answer correct to 4 significant figures.)



Answer a)  $AC =$  \_\_\_\_\_ cm

- b) Calculate  $\cos \angle ABD$ . (Give your answer correct to 2 decimal places.)

Answer b)  $\cos \angle ABD =$  \_\_\_\_\_

(6 marks)

10. Some teachers were asked how many lottery tickets they bought last week. The results are shown in the table.

- a) Find the mode for the number of tickets bought.

Mode = \_\_\_\_\_

- b) Find the median number of tickets bought.

Median = \_\_\_\_\_

Number of tickets	Numbers of teachers
0	2
1	7
2	5
3	2
4	0
5	3
6	1

- c) Work out the mean number of tickets bought.

Mean = \_\_\_\_\_

(6 marks)

11. a) Nine counters numbered 2 to 10 are put in a bag. One counter is selected at random. What is the probability of getting a counter with:

(i) a number 5 Answer \_\_\_\_\_

(ii) an odd number Answer \_\_\_\_\_

(iii) not an odd number Answer \_\_\_\_\_

(iv) a prime number Answer \_\_\_\_\_

(v) a square number? Answer \_\_\_\_\_

b) The price of a shirt was reduced by  $12\frac{1}{2}\%$  to Lm21 in a sale. What was the original price?

Answer \_\_\_\_\_

(8 marks)

12. The equation of a straight line is given in the form  $\frac{y-5}{2} = x$ .

a) Make  $y$  the subject of the equation.

Answer a) \_\_\_\_\_

b) What is the gradient of this line?

Answer b) \_\_\_\_\_

c) Work out the value of  $y$  when  $x = -2$ .

Answer c) \_\_\_\_\_

d) Where does the line cut the  $x$ -axis?

Answer d) \_\_\_\_\_

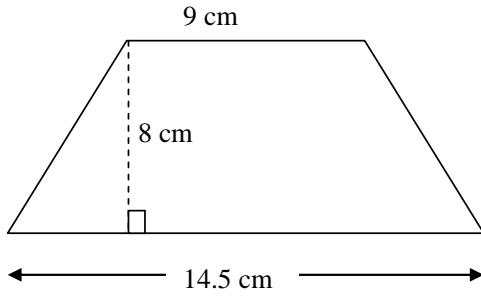
e) Find the point of intersection with the line  $y = -x + 5$ .

Answer e) \_\_\_\_\_

(8 marks)



13. a) Calculate the area of the trapezium.



Answer \_\_\_\_\_

- b) A waste paper bin is a cylinder with one end open. The diameter of the base is 22 cm and the height is 28 cm.

Giving your answers to the nearest whole number calculate:

- (i) the volume of the bin,

Answer (i) \_\_\_\_\_

- (ii) the total surface area of the bin.

Answer (ii) \_\_\_\_\_

(8 marks)

14. a) Complete the following table of values of  $x$  and  $y$  given that  $y = x(x - 2)$ .

$x$	-2	-1	0	1	2	3	4
$x - 2$	-4	-3		-1	0	1	
$y = x(x - 2)$		3	0	-1	0	3	8

- b) On the graph paper provided and taking 1 cm as 1 unit on both axes, draw the graph of  $y = x(x - 2)$ .

- c) Use your graph to:

- (i) find the lowest value of  $y$  and the corresponding value of  $x$ ;

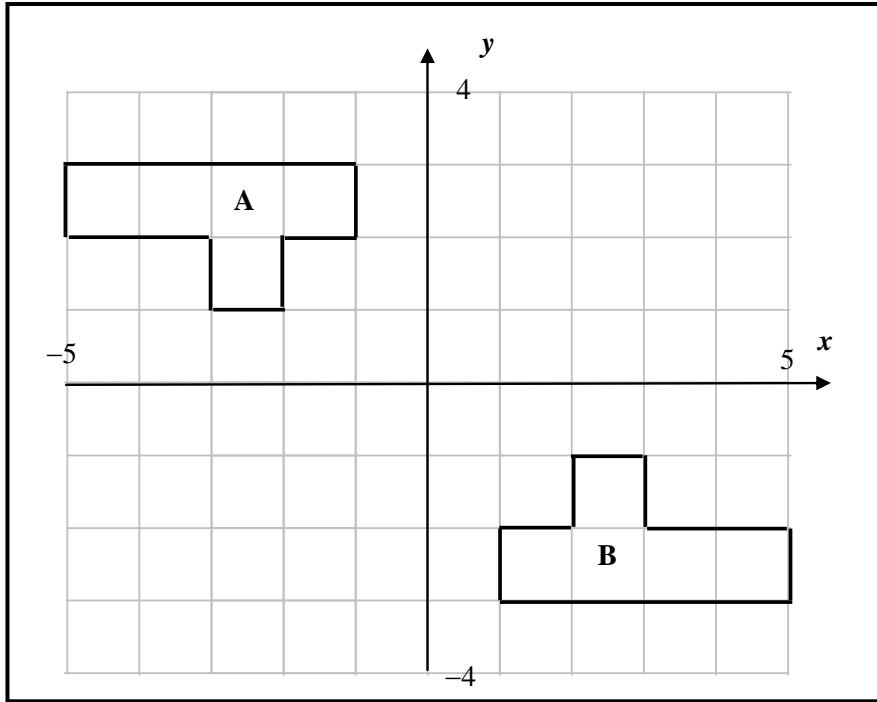
Answer (i)  $y =$  \_\_\_\_\_,  $x =$  \_\_\_\_\_

- (ii) solve the equation  $x(x - 2) = 3$ .

Answer (ii)  $x =$  \_\_\_\_\_, \_\_\_\_\_

(8 marks)

15. a) Describe fully the transformation which maps shape A onto shape B.

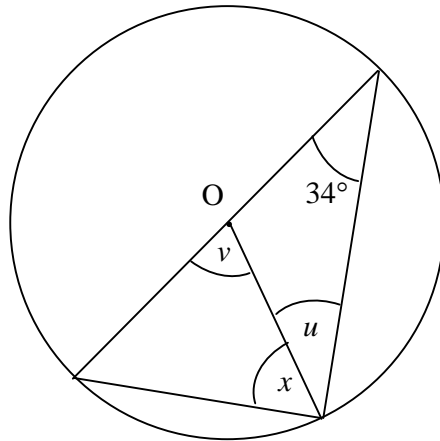



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b) Find the angles denoted by the letters in the given diagram. O is the centre of the circle. (Give brief reasons for your answers)



$u =$  \_\_\_\_\_ ( \_\_\_\_\_ )

$v =$  \_\_\_\_\_ ( \_\_\_\_\_ )

$x =$  \_\_\_\_\_ ( \_\_\_\_\_ )

(8 marks)

**END OF PAPER**