JUNIOR LYCEUM ANNUAL EXAMINATIONS 2008

DIRECTORATE FOR QUALITY AND STANDARDS IN EDUCATION

Educational Assessment Unit

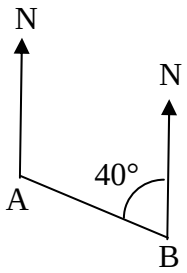
FORM 3 MATHEMATICS (Non-Calculator Paper) TIME: 10 minutes

Name: _____ **Class: _____**

Mark

INSTRUCTIONS TO CANDIDATES

- **Answer all questions. There are 10 questions to answer.**
- **Each question carries 1 mark.**
- **Calculators, rulers, protractors and other mathematical instruments are not allowed.**
- **You are not required to show your working. However space for working is provided if you need it.**

No.	Question	Space for Working
1	An approximate value of $\sqrt{109}$ is: A 5 B 20 C 50 D 10. **Answer:** _____	
2	Expand $3(x - 4y)$. **Answer:** _____	
3	Write the number one million and one hundred thousand in standard form. **Answer**: _____	
4	Work out $(0.5)^2$. **Answer:** _____	
5	What is the mean of 100, 150 and 200? **Answer:** _____	
6	Write $\frac{1}{32}$ as a power of 2. **Answer:** _____	
7	Mary is x years old and John is y years. What will their **total** age be in 4 years time? **Answer:** _____	
8	If $v = u + at$, make t subject. **Answer**: _____	
9	Factorise $2pq - 4p^2$ completely. **Answer:** _____	
10	 What is the bearing of B from A? **Answer**_____	

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Educational Assessment Unit

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) $t + t + t$

Ans: _____

b) $t \times t \times t$

Ans: _____

c) $(2t^2)^3$

Ans: _____

_____ (4 marks)

2. Work out:

a) $7\sqrt{4^2 + 3^2}$

Ans: _____

b) $3^4 \div 3^5$ Give your answer as a fraction in its lowest terms.

Ans: _____

c) 10^0

Ans: _____

_____ (4 marks)

3. Give your answers as fractions in their **lowest terms.**
A box contains 3 red, 5 green and 4 blue pencils. Pat chooses a pencil at random.
What is the probability that it is:

a) red Ans: _____

b) green Ans: _____

c) either green or blue Ans: _____

d) neither red nor green? Ans: _____

_____ (4 marks)

4. a) Calculate the simple interest paid on €950 invested at 3% per annum for $2\frac{1}{2}$ years.

Ans: _____

b) The cost price of a violin is €500. A music shop sells it at a profit of 11%. What is the selling price?

Ans: _____

_____ (4 marks)

5. a) What is the size of **each** exterior angle of a **regular** pentagon?

Ans: _____

b) Use the formula **Sum = $(2n - 4)\times 90°$** to work out the sum of the interior angles of a pentagon.

Ans: _____

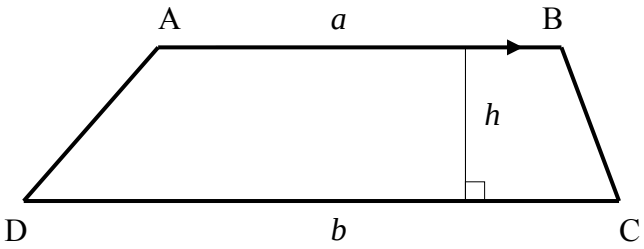
c) Four of the interior angles of a pentagon are 99°, 77°, 123° and 97°. What is the size of the fifth angle?

Ans: _____

_____(4 marks)

6. a) The diagram shows trapezium ABCD.

(i) Calculate its area when a = 5cm, b = 7cm and h = 4cm.

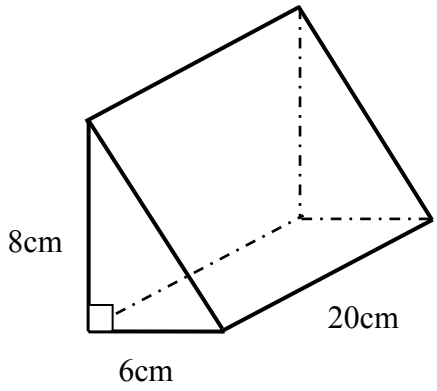


Ans: _____

(ii) The parallelogram PQRS below, has the same area as trapezium ABCD. Calculate the perpendicular distance between the parallel lines given that SR = 8cm.

Ans: _____

b) Work out the volume of the prism shown.



Ans: _____

_____ (6 marks)

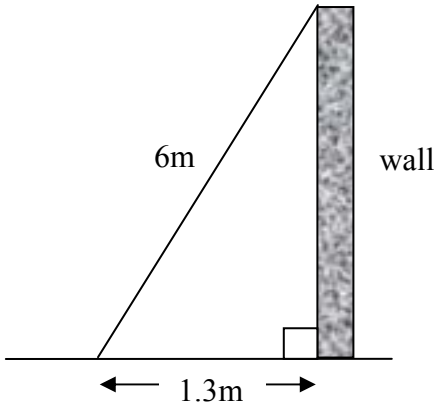
7. a) i) Given that cosA = 0.296, find angle A correct to the nearest degree.

Ans: _____

ii) Angle B = 45°. Write down the value of sinB correct to two decimal places.

Ans: _____

b) i) Mark's ladder leans against a wall as shown. Calculate the angle which the ladder makes with the ground. Give your answer correct to the nearest half degree.



Ans: _____

ii) Mark needs to use another ladder to climb a vertical wall which is 8m high. For safety reasons the foot of the ladder must be 1.5m away from the wall. Calculate the length of the ladder required. Give your answer correct to the nearest centimetre.

Ans: _____

_____ (6 marks)

8. a) Solve the equation: $\frac{3x}{2} + 5 = 26$

Ans:_____

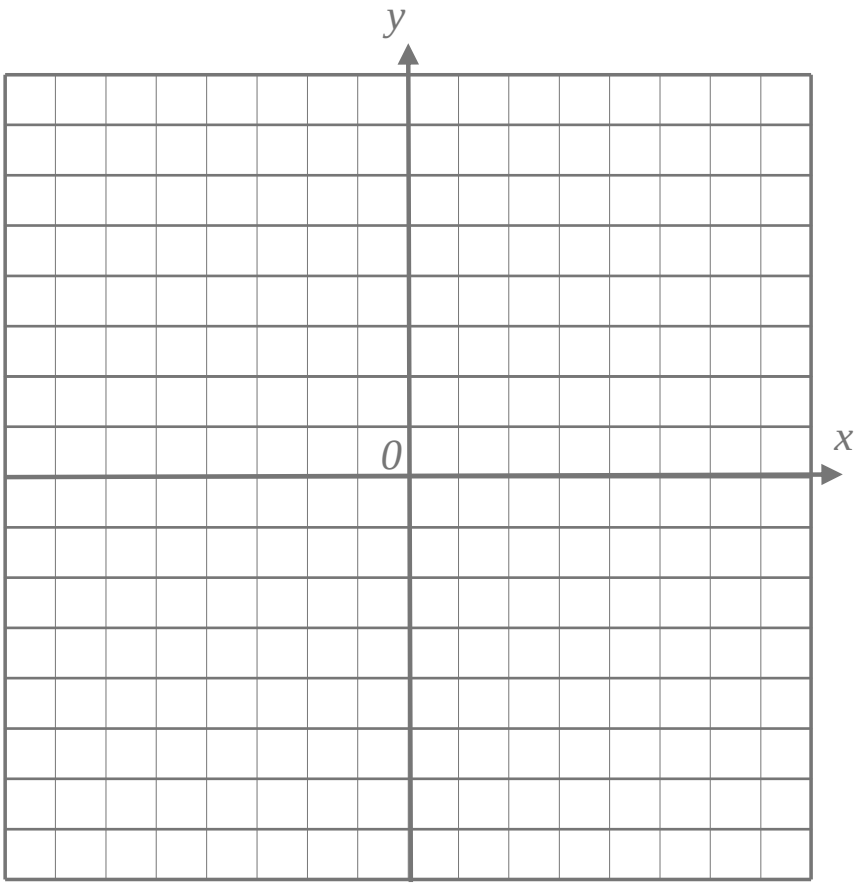
b) Solve the simultaneous equations: $3p + 6q = 24$
$3p + 4q = 18$

Ans: p =_____

Ans: q =_____

_____ (6 marks)

9. a) Plot the points (2,3), (4,3), (4,4), (3,4), (3,6), and (2,6) in the grid provided.



b) Join the points in the given order to get an L-shaped figure. Denote it by S.

c) Rotate S by 90° clockwise about the origin. Label the image T.

d) Reflect T in the Y-axis. Label the image U.

_____(6 marks)

10. a) Graziella wishes to draw a regular octagon using LOGO. Complete the following procedure to help her draw the octagon with sides 60 turtle steps long.

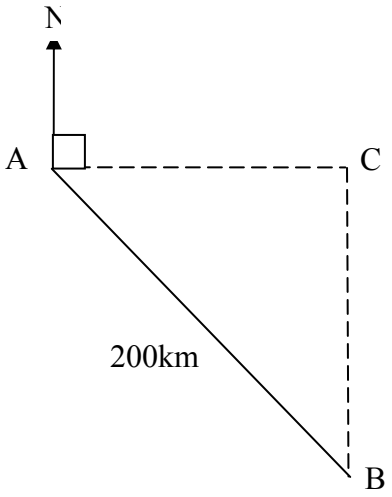
```
TO OCTAGON1
REPEAT ___ [ ___ 60 RT ___ ]
END
```

b) Graziella now wishes to draw another regular octagon showing all its exterior angles. The sides of this octagon are also 60 turtle steps long. Each side is extended by 10 turtle steps.
Complete the modified procedure to enable her draw the new polygon.

```
TO OCTAGON2
REPEAT ___ [ ___  ___  ___  ___ RT ___ ]
END
```

_____ (6 marks)

11. Airport A is due west of airport C. An aeroplane leaves airport A and flies south-east to another airport B 200km away. Airport B is due south of airport C.



(a) State the size of angles BAC and ABC.

Ans: _____

_____

(b) What type of triangle is the triangle ABC?

Ans: _____

(c) Calculate how far east the aeroplane has flown.
Give your answer correct to 4 significant figures.

Ans: _____

_____ (8 marks)

12. a) Complete the table for values of $y = 10 - x^2$.

x	-4	-3	-2	-1	0	1	2	3	4
+10	+10	+10	+10	+10	+10				
$-x^2$	-16	-9	-4	-1	0		-4		-16
y	-6	1		9	10	9	6	1	

b) Use a scale of 2cm for 1 unit on the x-axis and 1cm for 1 unit on the y-axis.
Plot the points on the graph paper provided and join them with a smooth curve.

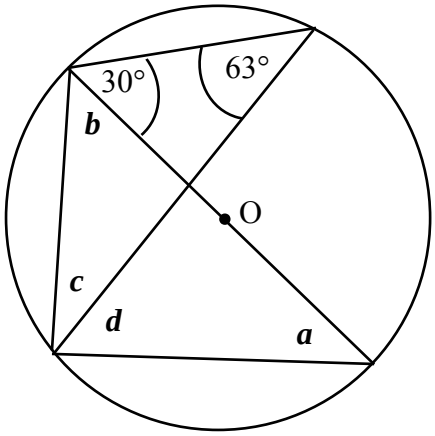
c) State the coordinates of the maximum point of the curve. Ans: _____

d) State the name of the line of symmetry of the curve. Ans: _____

_____(8 marks)

13. In the figure, O is the centre of the circle. Find the angles denoted by the letters.

Give brief reasons for your answers.



Answer: a = _____

Reason_____

Answer: b = _____

Reason_____

Answer: c = _____

Reason_____

Answer: d = _____

Reason_____

(8 marks)

14. a) Form 3 students are having a party. It costs a fixed amount of €110 to hire a disco and €5 per student for refreshments.

i) Write a formula for the total cost of the party. Use T for total cost in euro and n for number of students attending the party.

Ans: _____

ii) Use your formula to find T when 120 students go to the party.

Ans: _____

iii) Make n the subject of the formula and find n when T = €835.

Ans: _____

b) A line passes through the points (0, 4) and (2, 8).

i) What is the value of y where the line cuts the y-axis?

Ans: _____

ii) Calculate the gradient of the line.

Ans:_____

iii) Write down the equation of the line.

Ans: _____

(8 marks)

15. The data shows the amount of rain in millimetres that fell on each day in **November** last year.

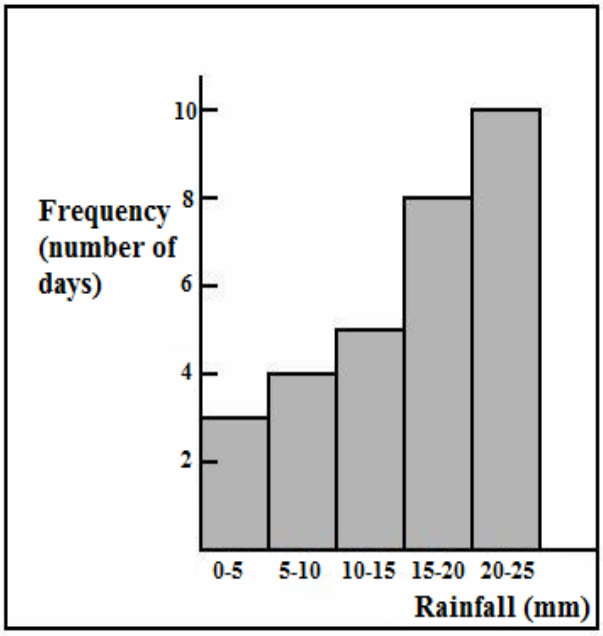
3.5	16.4	6.4	3.7	14.2	8.9
22.9	2.9	7.8	18.9	0.1	2.6
9.4	14.2	4.5	11.6	15.9	6.1
13.7	13.9	3.1	2.5	5.6	1.4
6.9	4.1	17.9	19.2	10.7	7.2

a) Use this data to complete the table below:

Amount of rain (x mm.)	Tally	Number of days
$0 \leq x < 5$		
$5 \leq x < 10$		
$10 \leq x < 15$		
$15 \leq x < 20$		
$20 \leq x < 25$		

b) Draw a bar chart on the grid provided below to show this information. Choose a suitable scale.

c) The bar chart below, on the left, shows the rainfall in **April**. Look at the bar chart you have drawn and the one given below. Which one shows the wetter month? Explain how you can tell.



Rainfall in April

Rainfall in November

_____

_____

_____ (8 marks)

END OF PAPER