

# LIKUNI BOYS SECONDARY SCHOOL

## 2008 FORM FOUR MOCK EXAMINATIONS

### MATHEMATICS

Time Allowed: 2 hrs  
08.00 – 10.00a.m.

PAPER I  
(100 Marks)

**Instructions:**

1. This paper contains 4 pages. Please check.
2. Before beginning, fill in your examination number at the top of each page.
3. Write your answers on the question paper.
4. Answer ALL the 24 and the maximum number of marks for each question is indicated against each question.
5. Scientific calculators may be used.
6. All working must be shown clearly and it should be done on the same sheet as the rest of the answer.
7. Write your Examination number on top of each and every page of your answer book, including all the graph papers used.
8. Make sure you understand the question before you start tackling it.

**Please answer ALL the 24 questions**

1. Simplify  $\frac{x^2 + xy}{x^2 - y^2}$  (3 marks)
2. Convert  $108_9$  to base 10 (3 marks)
3. Using logarithms, evaluate  $(460.01 \times 459.02)^{\frac{1}{2}}$  (4 marks)
4. Figure 1 is a right angled isosceles triangle with dimensions as shown

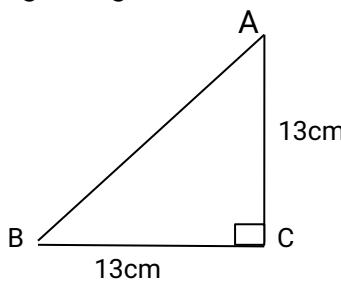


Figure 1

Show that Sin of angle ABC =  $1/\sqrt{2}$

**(4 marks)**

5. Simplify the following expression in its simplest surd form

$$2\sqrt{8} - 3\sqrt{32} + 4\sqrt{50}$$

**(3 marks)**

6. A box contains 6 cricket balls and 8 hockey balls. Fatani, who does not know the difference is told to go and get a cricket ball from the box.

(a) What is the probability that he will bring a cricket ball?

(b) What is the probability that he will take a hockey ball?

**(4 marks)**

7. A farmer uses 60m of fencing wire to make three sides of a rectangular sheep pen (fence kraal), the fourth side being a wall. Find the length of the shorter sides of the pen if the area enclosed is  $448\text{m}^2$ .

**(4 marks)**

8. A factory producing boxes carried out a sample check on the area of a cardboard being used to make their boxes. The results were as shown in Table 1 below

Area of box ( $\text{m}^2$ )	1.26	1.27	1.28	1.29	1.30
Number of boxes	3	8	16	12	5

**Table 1**

What is the mean area of cardboard used to make one box?

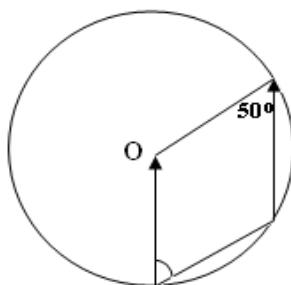
**(5 marks)**

9. Solve the equation

$$\log_6(2x - 5) = \log_6(3x - 9)$$

**(3 marks)**

10. Figure 2 below is a circle with properties as shown and O is the centre, find the marked by calculation.



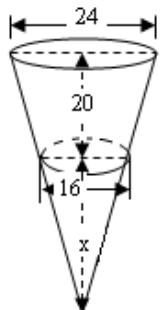
**Figure 2**

11. Using the graph paper provided, Show the area that is bordered by the following inequalities

- i.  $3x + 2y \leq 5$
- ii.  $y > -x + 3$
- iii.  $y \geq 0$
- iv.  $x \geq 0$

**(6 marks)**

12. Find the height of the cone shown in figure 3.



**Figure 3**

**(5 marks)**

13. What is the equation of the graph that have the following x – intercepts; -1 and 3 and y – intercept is -6

**(5 marks)**

14. The height of a cube is x cm

- (a) Write an expression for the surface area of the cube.
- (b) Write an equation in terms of x for the surface area, if the surface area is  $900\text{cm}^2$ .
- (c) Find the height of the cube

**(6 marks)**

15. In an Arithmetic Progression, the sum of n terms is given by the formula  $10n^3$

- 7n

- (a) Find the first term of the sequence
- (b) Find the common difference
- (c) Find the fourth term

(5 marks)

16. A hemispherical bowl of internal diameter 12cm, full of water, is emptied into a cylindrical can 8cm in diameter. How deep is the water in the can?

(5 marks)

17. A ladder 10.6m long leans against a wall, and touches it at a point 9m from the ground. Find the distance of the foot of the ladder from the wall, and the angle which the ladder makes with the ground.

(4 marks)

18. Divide  $3a^3 - 8a^2 + 13a - 6$  by  $3a - 2$

(4 marks)

19. Factorise  $12x^2 + 7xy - 10y^2$

(3 marks)

20. In figure below, triangle ABC is given where  $C = 34^\circ$ ,  $a = 50\text{cm}$ ,  $b = 40\text{cm}$ .

Find

- i. Angle A
- ii. Angle B
- iii. Side c

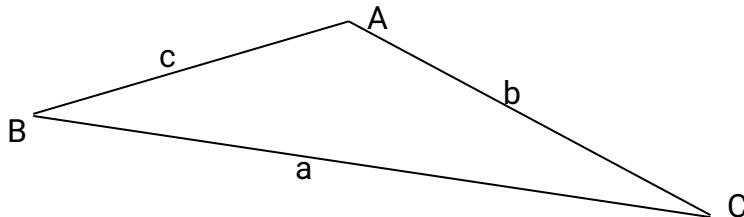


Figure 4

(6 marks)

21. If  $A = \begin{pmatrix} 2 & 2 \\ 1 & 3 \end{pmatrix}$  find  $A^2$

(3 marks)

22. Translation vector  $T = \begin{pmatrix} -2 \\ 5 \end{pmatrix}$

- (a) Find the image of triangle ABC with vertices A(0,2), B(-3,4) and C(2,6) under T
- (b) Show ABC and its image on the same diagram (Hint use the graph paper for the diagram)

**(4 marks)**

23. If  $2x^3 + nx^2 + 5x - 6$  is exactly divisible by  $x - 2$ , find n.

**(3 marks)**

24. Solve the inequality  $x^2 + x - 6 \geq 0$

**(3 marks)**

**END OF QUESTION PAPER**

*(SOME PEOPLE WILL NEVER CHANGE EVEN AFTER GETTING FORMAL EDUCATION OF HIGHER LEVELS. THIS CONCLUDES THAT THERE IS A BIG DIFFERENCE BETWEEN INTELLIGENCE AND WISDOM)*