

IMMACULATE CONCEPTION BOYS HIGH SCHOOL-MUKUYU

FORM THREE MATHEMATICS EXAM 1 TERM 1 2018

NAME.....ADM NO.....CLASS.....

SECTION I (50 MARKS)

Answer all questions

1. Simplify without using a calculator (3 marks)

$$\frac{3\frac{1}{3} - 2\frac{2}{3} \div 1\frac{5}{9}}{\frac{3}{7} \text{ of } 3\frac{2}{3} - 3\frac{4}{7}}$$

2. Solve the equation (2 marks)

$$\frac{4x - 5}{2} - \frac{2x - 1}{6} = x$$

3. The father is seven times as old as his son. Three years ago he was thirteen times as old as his son. Find the ration of their ages in four years time. (3 marks)

4. Solve the inequalities $5 \leq 3x + 2$ and $3x - 14 \leq -2$ (3 marks)

5. The ratio of the base areas of two cones is **9 : 6**

(a) Find the ratio of their volumes

(2 marks)

(b) If the larger cone has a volume of 125 cm^3 , find the volume of the smaller cone.

(2 marks)

6. Find the equation of a straight line passing through (1,4) and perpendicular to the line

$$2y + 3x = 5$$

(4 marks)

7. Solve the simultaneous equations:

$$x - 2y = 6$$

$$2x + 3y = 5$$

(3 marks)

8. Use logarithms to evaluate

(4 marks)

$$\sqrt[3]{\frac{383.2 \times 129.64}{863 \times (5.123)^2}}$$

9. The G.C.D of two numbers is 12 and their L.C.M is 240. If one of the numbers is 60, find the other number.

(2 marks)

10. Using tables evaluate

(3 marks)

$$\frac{1}{0.0134} + \frac{1}{0.0121}$$

11. Solve the equation

$$9^{4x} \div 3^{2x} = 2187$$

(3 marks)

12. A metallic cuboid measuring 16 cm by 8 cm by 4 cm was melted. The material was the used to make a cube. What was the length of the cube? (3 marks)

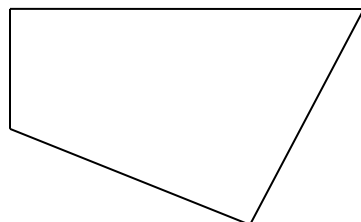
13. John walks 4.8 km due north from point A to B and then covers a further 6 km due east to C. what is the shortest distance from A to C? (2 marks)

14. Using trigonometric ratios, simplify (2 marks)

$$4 \cos 45^\circ \sin 60^\circ$$

15. Given that $\cos x = \sin(3x + 10)$, find x (3 marks)

16. Find the area of quadrilateral below; (3 marks)



17. Solve the quadratic equation below;

$$4x^2 + 7x - 5 = x^2 - 9 \quad (3 \text{ marks})$$

SECTION II (50 marks)

Answer any FIVE questions from this section

18. The marks scored by a group of pupils in mathematics test were as recorded in the table below:

MARKS	FREQUENCY
0-9	1
10-19	2
20-29	4
30-39	7
40-49	10
50-59	16
60-69	20
70-79	6
80-89	3
90-99	1

I. State the modal class. (1 mark)

II. Determine the mean mark. (5 marks)

- III. Determine the class in which the median mark lies and hence determine the median mark. (4 marks)

19. A glass in the form of a frustum of a cone is represented by the diagram below. The glass contains water to a height of 9 cm. The bottom of the glass is a circle of radius 2 cm while the surface of water is a circle of radius 6 cm.

- a) Calculate the volume of the water in the glass. (3 marks)

b) When a spherical marble is submerged into the water in the glass, the water level rises by 1 cm. Calculate:

- I. The volume of the marble: (4 marks)

- II. The radius of the marble. (3 marks)

20. Two business ladies, Jane and Janet contributed sh. 112,000 and sh. 128,000 respectively, to start a business. They agreed to share the profit as follows:

40% to be shared equally.

30% to be shared in the ratio of their contributions.

30% to be retained for the running of the business.

If their total profit for the year 2004 was sh. 86,400, calculate;

I. The amount received by each. (7 marks)

II. The amount retained for the running of the business. (3 marks)

21. A triangle whose vertices are $A'(-1.5, -2.5)$, $B'(-1.5, -1.5)$ and $C'(-3.5, -1.5)$ is an image of the triangle whose vertices are $A(1.5, 2.5)$, $B(1.5, 1.5)$ and $C(3.5, 1.5)$ under a rotation.

(a) Draw ABC and $A'B'C'$ on the graph paper provided. (2 marks)

(b) Find the centre and angle of rotation. (3 marks)

(c) Find the image of the points (0,3) and (2,2) under the same rotation.(2 marks)

(d) $A''B''C''$ is the image of $A'B'C'$ under the reflection in the line $x = 0$. Draw the image $A''B''C''$ and state its coordinates. (3marks)

22. The diagram below shows the velocity of a Matatu against time between two stops.

(a) Find the acceleration of the Matatu. (2 marks)

(b) What is the deceleration of the Matatu. (2 marks)

(c) What distance does the Matatu cover while accelerating? (3 marks)

(d) What is the distance between the two stops?

(3 marks)

23. Using compass and a ruler only, construct triangle ABC such that $AB = 7$ cm, $BC = 5.3$ cm and $\angle ABC = 120^\circ$ (3 marks)

(a) Measure AC and $\angle ACB$

(2 marks)

(b) Drop and measure the perpendicular from C to AB hence calculate the area of triangle ABC. (5 marks)

24. The figure below shows two intersecting circles with centre's P and Q of radius 8 cm and 10 cm respectively. Length AB = 12 cm

Calculate:

(a) $\angle APB$

(2 marks)

(b) $\angle AQB$

(2 marks)

(c) Area of the shaded region

(6 marks)

25. Show the region on the graph represented by the following inequalities hence state coordinates of points bounding the region. (10 marks)

$$x \geq 1, y \geq 1, x + y < 8, 3x + 5y < 30$$