



NOVA PIONEER
SCHOOLS FOR INNOVATORS & LEADERS

Form 3 End Term Exam
Mathematics (121/1) Paper 1
Term 2, 2020.

DATE:

MARKS: 80 Marks

2 ½ hours

Name:

Stream #: **House:**

Part A Score:/50= % **Part B Score:**/30 =%

Total Score: /80 = %

Directions:

1. This paper contains of two sections; *Sections A* and *Section B*.
2. Answer **ALL** the questions in both *Section A* and *Section B*.
3. Read all questions carefully.
4. Show **ALL** the steps in your calculation, giving your answer at each stage in the spaces provided.
5. Non-programmable silent electronic calculators and KNEC mathematical tables are allowed.
6. Review your answers before turning in your exam.

Mark Tally: Teacher's use only

Section A:

1	2	3	4	5	6	7	8	9
10	11	12	13	14				

Section B

15	16	17					
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SECTION A (50 MARKS)

Answer all questions in this section

1. Evaluate and simplify without using a calculator (3 marks)

$$\frac{3\frac{1}{5} + \frac{1}{4} \text{ of } 3\frac{1}{2} - 5\frac{1}{6}}{2\frac{2}{3} - 1\frac{2}{5} \div 1\frac{1}{3} + 3\frac{3}{4}}$$

2. The sum of interior angles of a polygon is 1980° . Find the number of sides the polygon has. (2 marks)
3. Simplify as far as possible by rationalizing the denominator. (3 marks)

$$\frac{1 + \sqrt{2}}{2 + \sqrt{3}} - \frac{1 - \sqrt{2}}{2 - \sqrt{3}}$$

4. Use table of reciprocal only to work out the following: (3 marks)

$$\frac{3}{0.6735} + \frac{13}{0.156}$$

5. Solve $3x - 2 \leq 5x - 6 < 2x + 12$ and represent your solution on a number line. Hence state the integral values. (4 marks)
6. Evaluate without using mathematical tables. (3 marks)

$$2 \log 5 - \frac{1}{2} \log 16 + 2 \log 40$$

7. Given that $P=2.6\text{cm}$, $Q=4.0\text{ cm}$ and $R=7.8\text{cm}$. Find the percentage error in the expression.

$$\frac{P+Q}{R}$$

(3 marks)

8. From a point 20m away on a level ground the angle of elevation to the lower window line is 29° and the angle of elevation to the top line of the window is 32° . Calculate the height of the window. (3 marks)
9. Simplify. (3 marks)

$$\frac{2y^2 - xy + x^2}{2x^2 - 2y^2}$$

10. Given that $\sin A = \frac{4}{5}$, $\cos B = \frac{5}{12}$ A and B are acute angles. Without using tables calculate:

$$\sin B \cos A + \sin A \tan B$$
 (3 marks)

11. A two-digit number is such that the sum of the digits is 11 where the digits are reversed the number exceed the original number by 9. Calculate the original number. (3 marks)

12. Two boys and a girl shared some money. The elder boy got $\frac{4}{5}$ of it, the younger boy got $\frac{2}{5}$ of the remainder and the girl got the rest. Find the percentage share of the younger boy to the girl's share. (4 marks)

13. Solve the following simultaneous equations. (4 marks)

$$\begin{aligned}x^2 - xy &= 2 \\ x + y &= 3\end{aligned}$$

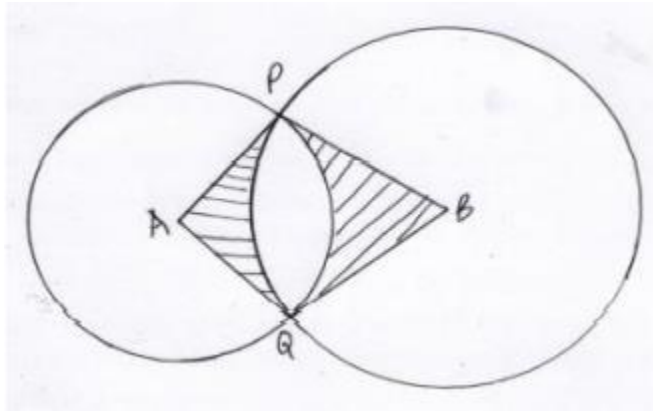
14. Use the table of squares, square roots and reciprocals to evaluate to 3 decimal places the question below. (4 marks)

$$\frac{10}{\sqrt{0.625}} + (1.64)^2$$

SECTION B (30 MARKS)

Answer all questions in this section

15. The diagram below shows two circles centre A and B which intersect a point P and Q. Angle PAQ = 70° and $\angle PRQ = 40^\circ$ and PA = AQ = 8cm.



Use the diagram to calculate to 2d.p

- (a) The length PQ (2 marks)
 (b) The length PB (2 marks)
 (c) Area of minor segment circle centre A. (2 marks)
 (d) Area of the shaded region (4 marks)
16. The following table shows the heights to the nearest centimeter of some maize plants in a research farm.

Height (cm)	80-84	85-89	90-94	95-99	100-105	105-109	110-114	115-119
Frequency	5	14	16	17	24	12	11	4

- a. State the modal class (1 mark)
 - b. Find to 2d.p
 - i. The mean Height (4 marks)
 - ii. The difference between the mean height and the median height. (5 marks)
17. Transline bus left Nairobi at 8.00a.m and travelled to Kisii at an average speed of 80km/h. Given that the distance between Nairobi and Kisii is 400km, calculate;
- (a) The time the car arrived in Nairobi. (3 marks)
 - (b) The time the two vehicles met. (3 marks)
 - (c) The distance from Nairobi to the meeting point (2 marks)
 - (d) The distance of the bus from Kisii when the car arrived in Nairobi. (2 marks)

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