

**FORM 2
MATHEMATICS
PAPER- JUNE/JULY
TIME: 2HOURS**

INSTRUCTIONS TO CANDIDATES

1. Write your name and index number in the spaces provided at the top of this page.
2. This paper consists of two sections: **Section I and Section II**
3. Answer all questions in **section I and Section II.**
4. Show all the steps in your calculations, giving your answers at each stage in the spaces below each question.
5. Marks may be given for correct working even if the answer is wrong.
6. Non-programmable silent electronic calculators **and KNEC Mathematical tables** may be used.

FOR EXAMINER'S USE ONLY

SECTION I

1	2	3	4	5	6	7	8	9	10	TOTAL

SECTION II

11	12	13	TOTAL

SECTION I (40 MARKS)

ANSWER ALL QUATIONS IN THIS SECTION

1. Find the equation of a line through point (5, -1) and perpendicular to line $4x + 2y - 3 = 0$.

(3mks)

~~A~~ $2y = -4x + 3$

$y = -2x + \frac{3}{2}$

$-2m_2 = -1$

$m_2 = \frac{1}{2}$

~~$y+1$~~ $= \frac{1}{2}$
 $x-5$

$2y+2 = x-5$

$2y-x = -7$

2. Two spheres have surface areas of 36cm^2 and 49cm^2 . If the volume of the smaller sphere is 20.2cm^3 calculate the volume of the larger one. (3 mks)

$\sqrt{36} = 6$
 $\sqrt{49} = 7$

$V \propto r^3 = 216 : 343$
 $216 - 20.2$
 $343 - ?$

$\frac{343 \times 20.2}{216}$
 32.08cm^3

3. Find the integral values of x which satisfy the following inequality.

$6 - 3x \leq 2x - 4 < x + 1$

$6 - 3x \leq 2x - 4$

$-5x \leq -10$

$x \geq 2$

$2x - 4 < x + 1$

$x < 5$

$2 \leq x < 5$ 2, 3, 4

(3 marks)

4. Factorize the quadratic expression below: $x^2 + 6x + 9$

~~$x^2 + 6x + 9$~~ (3, 3)

~~$x(x+3) + 3(x+3)$~~

~~$x(x+3) + 3(x+3)$~~

$(x+3)(x+3)$

(3mks)

5. The interior angles of n angles is 150° . Find the value of n. (3 mks)

$\frac{360}{36}$

12 sides.

6. Simplify the following expression $\frac{ax-ay+bx-by}{a+b}$

$\frac{a(x-y) + b(x-y)}{(a+b)}$

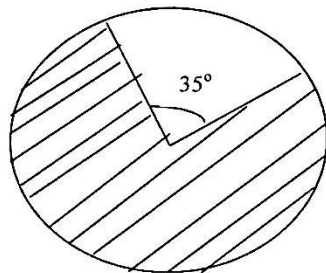
$\frac{(a+b)(x-y)}{(a+b)(x-y)}$

$x-y$

(3 mks)

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7. Calculate the area of the shaded region given that the radius is 27cm (4 mks)



$$\frac{32\pi}{360} \times 27 \times 27$$

$$\underline{658.125 \text{ cm}^2}$$

8. Simplify: $\frac{\frac{1}{2} \text{ of } \frac{5}{7} + (\frac{3}{5} + \frac{2}{5})}{3\frac{1}{3} - 1\frac{4}{9}}$ (3 mks)

<p>Numerator</p> $\frac{1}{2} \text{ of } \frac{5}{7} + (\frac{3}{5} + \frac{2}{5})$ $\frac{1}{2} \times \frac{5}{7} \times 1$ $\frac{5}{14}$	$\frac{10}{3} - \frac{13}{9}$ $\frac{30 - 13}{9}$ $\frac{17}{9}$	$\frac{\frac{5}{14} \times 9}{17}$ $\frac{45}{238}$
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9. Using a pair of compasses and a ruler only construct a triangle ABC such that AB= 4cm, BC = 6cm and angle ABC = 135°. (3mks)

10. Calculate the volume of a sphere of radius 9cm

$$V = \frac{4}{3} \pi r^3$$

$$\frac{4}{3} \times 3.142 \times 9^3$$

$$= \underline{3054.024 \text{ cm}^3}$$

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(3mks)



12. A soda depot had 30 816 sodas which were packed in crates. Each crate contained 24 sodas. The mass of an empty crate was 2 kg and that of a full crate 12 kg.

a) How many crates were there? (2mks)

$$30816 \div 24 = 1284 \text{ crates}$$

b) What was the total mass of empty crates? (2mks)

$$1284 \times 2 = \underline{\underline{2568 \text{ kg}}}$$

c) What was the total mass of sodas alone? (3mks)

$$12 - 2 = 10 \text{ kg}$$

$$10 \times 1284$$

$$\underline{\underline{12840 \text{ kg}}}$$

d) A lorry was hired to transport the crates at a cost of shs 5 per crate of soda per trip. The lorry could only carry 107 crates per trip. How much money was spent on transporting all the crates?

(3mks)

$$\frac{1284}{107} = 12 \text{ trips}$$

$$5 \times 107 = 535$$

$$12 \times 535$$

$$\underline{\underline{\text{KSh } 6420}}$$

13. A country bus left Nairobi at 10.45a.m and traveled towards Mombasa at an average speed of 60km/h. A matatu left Nairobi at 1:15p.m on the same day and traveled along the same road at an average speed of 100km/h. The distance between Nairobi and Mombasa is 500km.

(a) Determine the time of the day when the matatu overtook the bus (5mks)



$$s = 60 \text{ km/h} \times 5 \frac{1}{2} \text{ hr}$$

$$= 150 \text{ km}$$

Bus 10:45 am

60 km/h

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Matatu 1:15pm

100 km/h

$$\frac{x}{60} = \frac{150+x}{100}$$

$$100x = 9000 + 60x$$

$$\frac{40x}{60} = \frac{9000}{40}$$

$$x = 225$$

$$T = \frac{225}{60}$$

$$= 3 \text{ hrs } 45 \text{ min}$$

$$\begin{array}{r} 1.15 \\ 3.45 \\ \hline \end{array}$$

$$5.00$$

$$\underline{\underline{5.00 \text{ PM.}}}$$

(b) Both vehicles continue towards Mombasa at their original speeds. How long had the Matatu waited before the bus arrived? (5mks)

Time taken by Matatu to Mombasa \rightarrow

$$T = \frac{125}{100}$$

$$= 1 \text{ hr } 15 \text{ min.}$$

Time taken by bus to Mombasa.

$$T = \frac{125}{60}$$

$$2 \text{ hrs } 5 \text{ min.}$$

$$\begin{array}{r} 2.05 \\ 1.15 \\ \hline 0.50 \end{array}$$

$$\underline{\underline{1 \text{ hr } 30 \text{ min.}}}$$