`Name: ....Adm. No: ....

Stream: ....   Student's Signature: ....

Date: ....

121/1
MATHEMATICS
TERM ONE
TIME: 2 HOURS

MATHEMATICS
PAPER

INSTRUCTIONS TO CANDIDATES:
* *Write your **name, admission number** and your school in the spaces provided above.*
* *This paper consists of **two** sections; **I** and **II***
* *Answer **all** the questions in section **I** and any five questions in section **II** in the spaces provided.*
* *All working **must** be clearly shown in the spaces provided.*
* *Electronic calculators and KNEC mathematical tables may be used.*

FOR EXAMINERS' USE ONLY:

Section	Total marks
I	
II	
Grand total	

1. a) State the place value and total value of the underlined digit in **4 7 3 6 4 5** (2mk)

   b) Write the number in (a) above in words (2mks)

2. Evaluate $\dfrac{\frac{3}{4} + 1\frac{5}{7} \div \frac{4}{7}\text{ of }2\frac{1}{3}}{(1\frac{3}{7} - \frac{5}{8}) \times \frac{2}{3}}$ (4mks)

3. Kamau spent Sh. 207 to buy seven books and four pencils. While Kanana spent 165 to buy five books and five pencils of the same type. Find the cost of each item. (4mks)

4. Evaluate $\dfrac{-8 \div 2 + 12 \times 9 - 4 \times 6}{56 \div 7 \times 2}$ (3mks)

5. Muli leaves behind 50 hectares of land and sh. 120,000 savings in his will. The land was sold at sh. 80,000 per hectare. If his wife gets sh. 520,000 and the rest is divided equally among his four sons and two daughters, how much money does each child get? (4mks)

6. Three tanks are capable of holding 60, 90 and 180 litres of water. Determine the capacity of the greatest vessel which can be used to fill each of them exactly. (3mks)

7. Two toilets are designed to flush automatically at intervals of 6 and 8 minutes. After how long will they next flush at the same time? (2mks)

8. Convert $0.1\dot{5}$ into (2mks)

9. Solve the equation. (4mks)
$$\frac{x+1}{2} + \frac{2x+1}{3} = 9$$

10. Find the value of the angles marked x and y in the figure below.
Give reasons for your answer. (2mks)
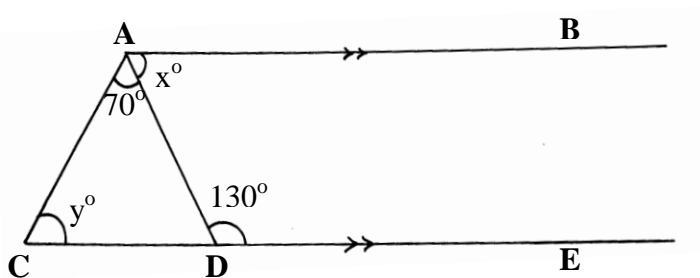
11. The figure below show s a right angled triangular prism of uniform cross- section AF = 6cm, AB = BC = 12cm and CE = 8cm. Find the surface area of the prism. (4mks)
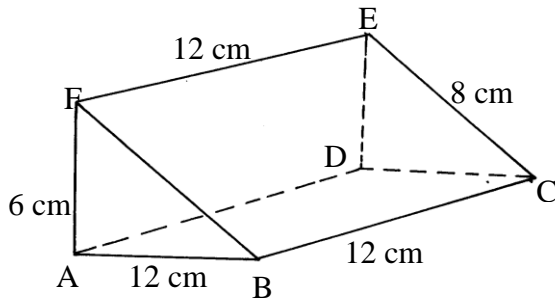
12 Find the value of the expression. (3mks)

$$\frac{3a - 2b + 2 (a^2 - 3b)}{4a - 2b}$$

When a = 2 , and b = 3.

13. A,B, and C are three quantities such that A: B = 3: 2 and B:C = 4:5
Find the ratio A:B:C (2mks)

14. A running track of length 100m is the shape of a rectangle with two semicircular ends of radius 35cm each as shown in the figure below. A long distance runner ran 25 times round the track. What distance did he cover in Kilometers? (4mks)
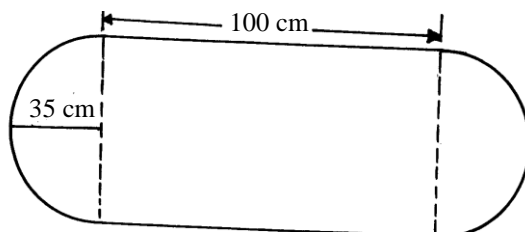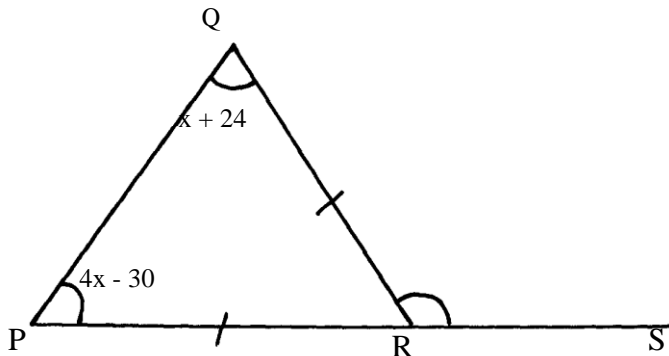
15. A commercial bank buys and sells U.S dollars in Kenya Shillings at the rate below.

	Buying	**Selling.**
	Sh. 74	sh.79

A tourist at the end of his tour of Kenya was left with sh. 30,000 which he converted to U.S dollars. How many U.S dollars did he get? (2mks)

16. In the figure below, $\angle$ RPQ = $(4x - 30)^o$ $\angle$ PQR = $(x - 24)^o$. Given that PR = QR, Find $\angle$ QRS (3mks)

SECTION II (50MARKS)

Answer only five questions in this section the spaces provided.

17. Using a ruler and a pair of compasses only;
    (a) Construct triangle PQR in which PQ = 5cm, QR = 8cm and angle QPR = 45° (4mks)
    (b) Measure line PR and angle PQR (2mks)
    (c) i) Construct a perpendicular from Q to meet line PR at S and measure QS (2mks)
       ii) Hence, find the area of triangle PQR (2mks)

18. (a) Express the following numbers as products of prime factors using power notation.   (4mks)
    (i) 5148   (ii) 6084

      (b) Hence (i) evaluate $\dfrac{(5148)^2}{\sqrt{6084}}$ (4mks)

      ii) Find H.C.F and L.C.M of 5148 and 6084.   (2mks)

      (c) Leaving your answers in (i) and (ii) in Prime factor from.

19. The height and the radius of a cylindrical water tank are 10m and 5m respectively.
    (a) (i) Find the capacity of the tank in litres. (Take π = 3.142) (3mks)

    (ii) Water was allowed into the empty tank at a constant rate of 29 litres per second at 2030hrs.
        What time will the tank be completely full? Give you answer in 12hrs system (4mks)

    b) An institution uses an average of 250,000 litres each a day. How many complete days will a full
       tanks last the institution (3mks)

20 (a) The angle of elevation from a point A to the top of building 5m away is 45°. Another point B is 4m
        from A. By scale drawing determine.

        (i) The angles of elevation from point B

        (ii)The height of the building (6mks)

(b) A man who is in elevator half way the building notices a lorry approaching the building at an angle of depression 20°. Use the scale drawing to determine how far the lorry is from the foot of the building (4mks)

21 a) A large scale farmer uses ½ of his land to plant maize, 1/5 for planting beans ,1/3 of the remainder for grazing and the rest for horticultural farming. If he use l0 hectares for grazing, determine how much land he uses for horticultural farming. (4mks)

(b) Kirui left sh2,116,800 in his will to be shared between his wife daughter and son in the ratio 1: 2:3. His wife decided to divide her share equally between her daughter and son. Find how much the son finally got. (6mks)

22) Raula bought a second hand car and later sold it through a sales agent who charged 7 ½ % commission on the price of the car, she received sh. 222,000 from the agent after the latter had deducted her commission. Raula incurred a loss of 25% on the price at which she had bought the car.

a) Calculate the price at which the agent sold the car. (3mks)

b) Find the price at which Raula had bought the car (2mks)

c) If, the amount Raula paid for the car was 26% less than the price of the new car, calculate the price of the new car. (3mks)

d) Express as a percentage the amount Raula received for her car to its price when new. (2mks)

23. The tables below represent linear relations between **x** and **y**. In each table some values of y against **x** are given and the corresponding point (x, y) also given.

2x – y = 3

X	-4	-2	0	3	5	7	8
y=2x -3	-11				7		
Point	(-4,-11)				(5,7)		

3x – 2y = 4

X	-2	0	2	4	6	8	10
y=$\frac{3x -4}{2}$		-2					13
Point		(0,-2)					(10,13)

a) Copy and complete each table   (2mks)

b) Using a suitable scale plot the points from each table on the same grid and hence draw the straight line representing each relation   5mks)
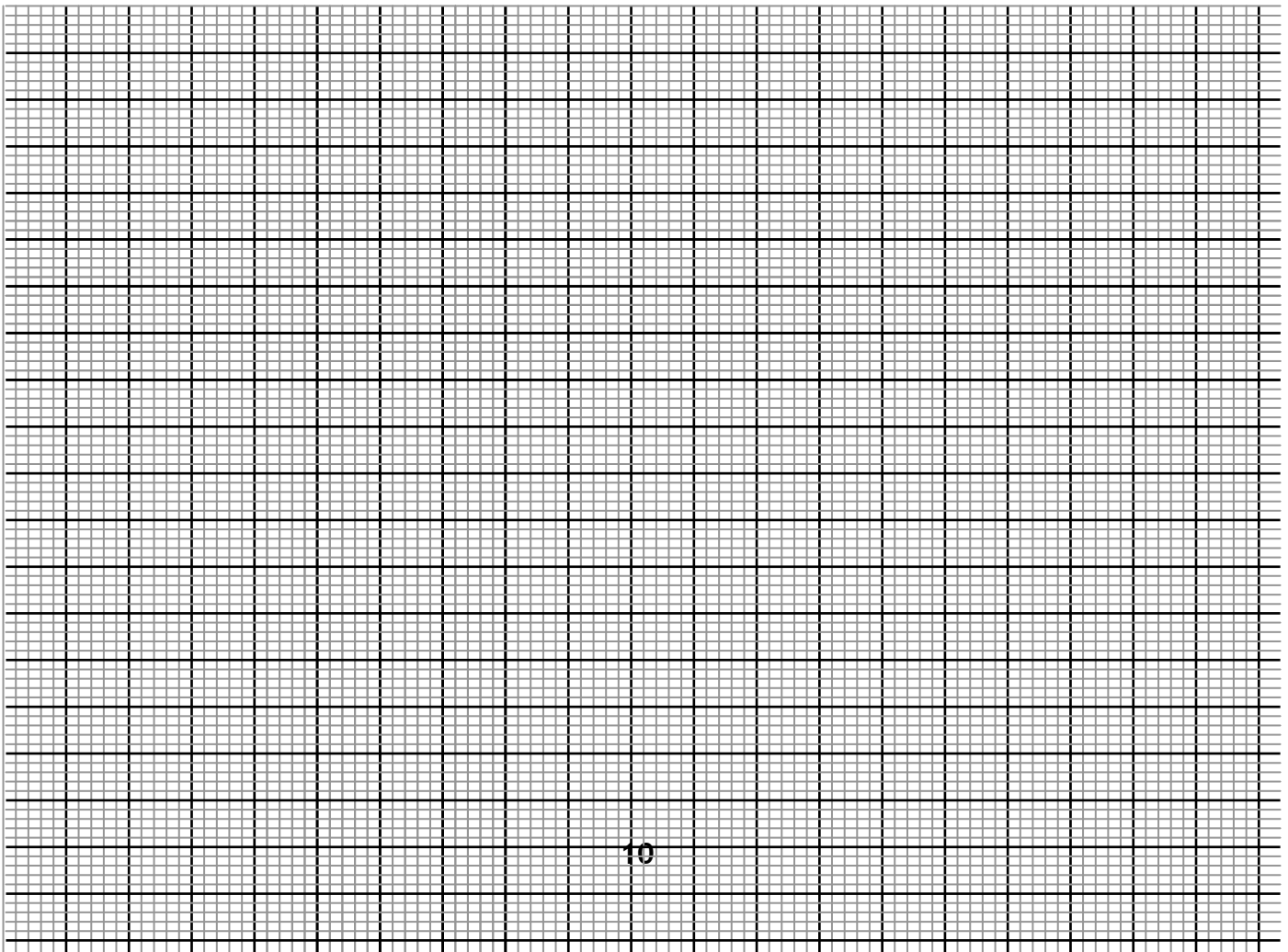
c) Use your graph to solve the simultaneous equations

      2x – y = 3

      3 x – 2y = 4

d) The line whose equation is **2x – y = 3** cut's the x – axis and the y – axis at P and Q respectively. From you graph state the coordinates of P and Q. (2mks)

24. A bus left Nairobi on Thursday evening and traveled to Dar-es-salam according to the travel time table below and arrived there on Saturday morning.

Nairobi	Dep 2015 h
Namanga	Arr: 2325h
	dep: 0310h
Arusha	Arr: 0640h
	Dep: 0820h
Dodoma	Arr: 2100h
	Dep: 2255h
Dar – es – Salam	Arr: 1015h

a) Determine the total

   i) Traveling time for the whole journey (3mks)

ii) Stoppage time in all stations   (3mks)

iii) Time taken for the whole journey   (2mks)

b) Given that the average speed of the bus for the whole journey is 60km/h, calculate the distance
    between Nairobi and Dar-es- salaam   (2mks)