St. Mary's School, Yala

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NAME……..……..CLASS…….ADM …….

FORM 2 2022 HOLIDAY ASSIGNMENT

121

MATHEMATICS

FORM 2, 2022

TIME: 2 ½ HOURS

Kenya Certificate of Secondary Education 2022

INSTRUCTIONS TO CANDIDATES

1. *Write your name and admission 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. ***KNEC** Mathematical tables may be used.*

For Examiner's Use Only

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total

17	18	19	20	21

Grand Total 100

SECTION I (50 Marks)

1. All even numbers less than ten are arranged in descending order to form a number.
   a) Write the number formed (1 mark)

   b) State the total value of the second digit in the number formed in (a) above (1 mark)

2. A man imported a machine at Sh. 600 000 and sold it at Sh. 1 080 000. Find the percentage profit if he spent Sh. 60 000 for clearing the machine from the port and a further Sh. 40 000 for shipping. (3 marks)

3. A liquid spray of mass $384g$ is packed in a cylindrical container of internal radius $3.2cm$. Given that the density of the liquid is $0.6g/cm^3$,calculate to 2 decimal places the height of the liquid in the container (4 marks)

4. Without using tables or a calculator evaluate (3 marks)

$$\frac{2 \times (-3) + 35 \div 5}{-9 + 14 \div 7 + 4}$$

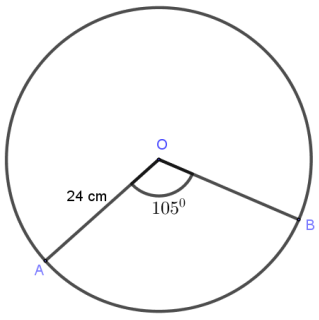
5. Given that $4.\dot{3}\dot{5} = 4\frac{a}{b}$, find the difference between a and b. (3 marks)

6. Mapesa travelled by train from Butere to Nairobi .The train left Butere on Sunday at $2350hours$ and travelled for $7hours$ 15 $minutes$ to reach Nakuru .After 45 $minutes$ stop, in Nakuru ,the train took $5hours$ 40 $minutes$ to reach Nairobi .Find the time, in the 12 $hour\ clock\ system$and the day Mapesa arrived in Nairobi (2 marks)

7. Three similar pieces of timber of length $240cm$,$320cm\ and$ $380cm$ are cut into equal pieces .Find the largest possible area of a square which can be made from any of the three pieces
(3 marks)

8. Evaluate $\sqrt{98.29} + (2.475)^2$ (3 marks)

9. In the figure below, a circle centre O and radius R =24 cm the minor arc **AB** subtends an angle of $\mathbf{105}^0$ at the centre of the circle and the corresponding sector **AOB** .Calculate the area of minor sector **AOB** **(**take $\boldsymbol{\pi = \frac{22}{7}}$**)** **(**3 marks)

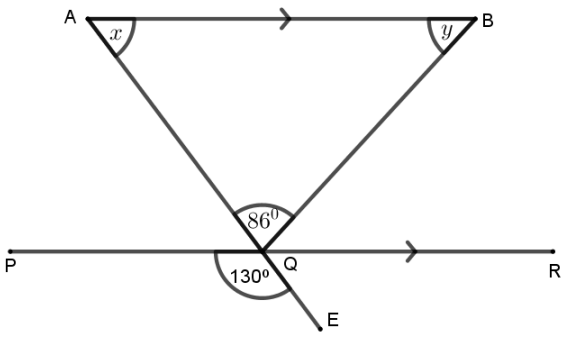


10. Wekesa spent one eighth of his February salary on farming , half on school fees and two thirds of the remainder on food .If he spend shs 3200 on food Calculate

a) His February salary (2 marks)

b) The amount he spent on school fees. (1 mark)

11. In the figure below, lines AB and PR are parallel. Angle $AQB = 86°$ and angle $PQS = 130°$. Giving reasons find the values of x and y. (3 marks)



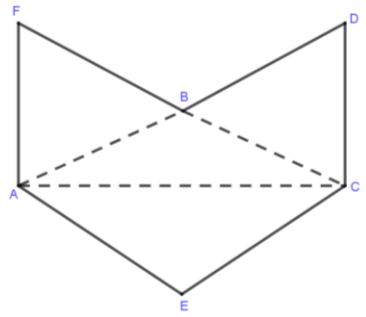
12. Find the prime factors of the following numbers leaving the answer in power form.

a) 300 (2 marks)

b) 24 (1 mark)

13. A cylindrical tank of diameter $1.4m \ \ and\ height\ 1.2m$ is two-thirds full of water. Calculate the capacity of the tank in litres $(use\ \pi = \frac{22}{7})$ (3 marks)

14. Below is a net of a model of a solid. The lengths $AB = Bc = AC = 6\ cm$ and lengths $AF = FB = BD = CD = CE = AE = 8\ cm$. Sketch the solid of the net by taking ABC as the base and the height 5 cm. (3 marks)



15. Using a ruler and pair of compasses **only** construct triangle **ABC** in which $\boldsymbol{BC = AC = 6cm}$ and angle $\boldsymbol{ACB = 135^0}$**.** Measure line **AB** (4 marks)

16. Simplify the following expressions

a) $\frac{2y+4}{(2+y)(2-y)}$ (2 marks)

b) $\frac{8mn-6m+8n^2-6n}{2(4n-3)}$ (2 marks)

SECTION II (50 marks)

Attempt any ALL questions in the spaces provided in this section

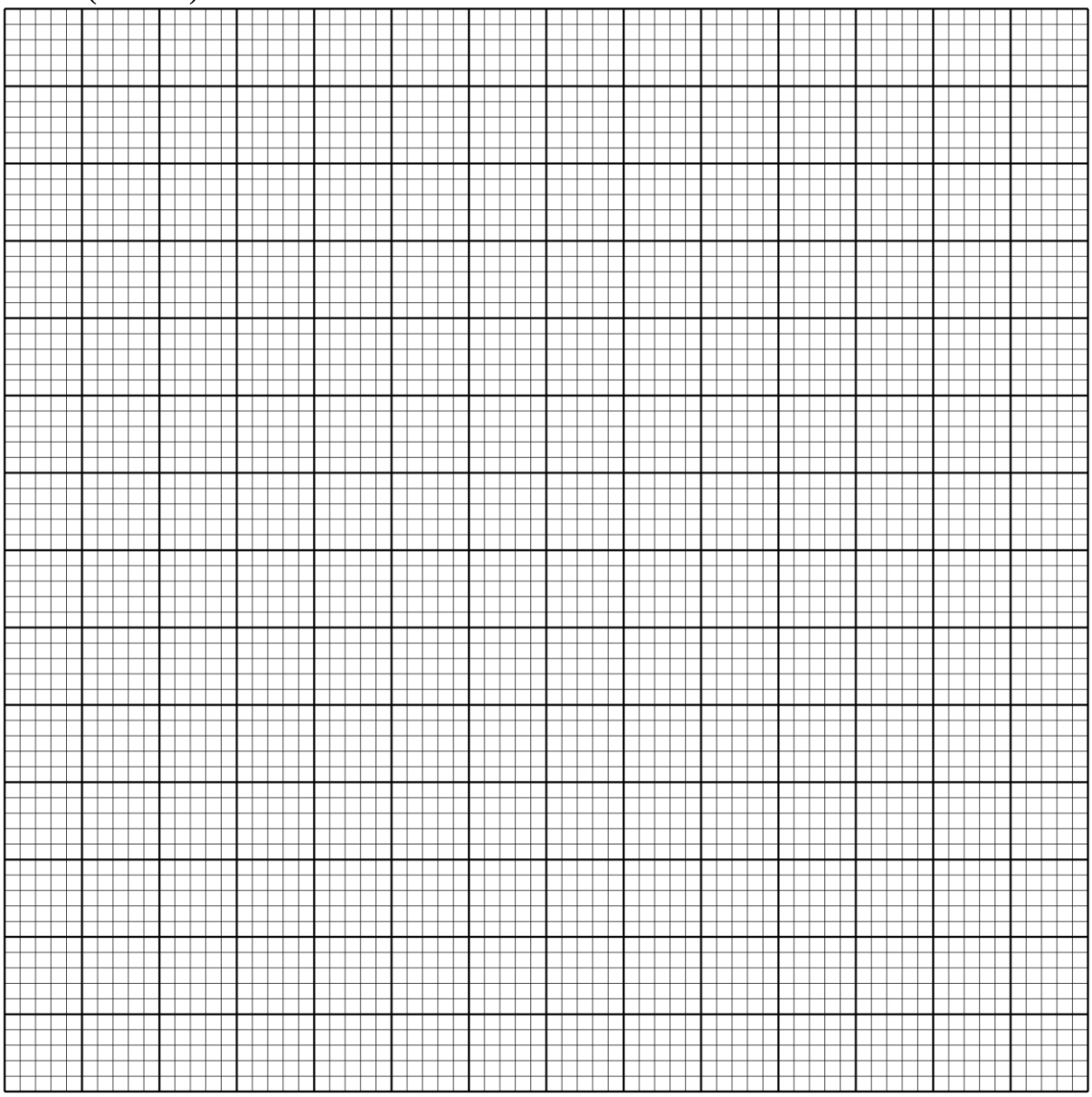
17. On applying brakes, a train travelling at s km/h can be stopped within a distance d metres where $d = \frac{1}{50}s^2 + \frac{1}{5}s$.

The table below shows some values of s and d

s	0	5	10	15	20	25	30	35	40	45	50
d						17.5					60

a) Complete the table above. (2 marks)

b) Using a scale of 1 cm to represent 5 units on both axes, draw the graph of d against s. (4 marks)



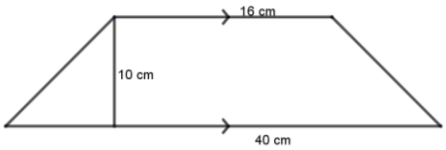
c) Use the graph to determine;

i. The stopping distance for a train travelling at 36 km/h. (1 mark)

ii. The stopping distance for a train travelling at a speed of 55 km/h. (2 marks)

iii. The speed at which the train is travelling if its stopping distance is 44 metres. (1 mark)

18. (a) Find the area of the figure below (2 marks)

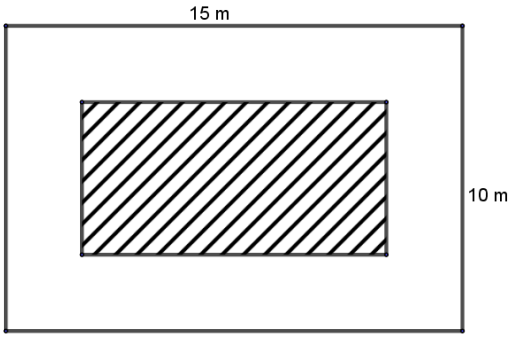


(b) A piece of wire is in the shape of an arc of a circle, radius 10.5cm .The angle at the centre is 150^0

i) Calculate the length of the wire (2 marks)

ii) If the wire is bent to form a complete circle find its radius (3 marks)

(c) A flower garden measuring 10m by 15m is surrounded by a path 2m wide as shown below. Find the area of the path (Unshaded region). (3 marks)



19. (a) Solve for x in the following equations

i) $\frac{x+4}{5} + \frac{x+3}{5} = 6$ (2 marks)

ii) $\frac{x-2}{3} - \frac{3-x}{4} = \frac{x-2}{2}$ (3 marks)

(b) A cloth dealer sold 3 skirts and 2 blouses for k.sh 840 and 5blouses and 4 skirts for Ksh 1680. Find the cost of 1skirt and 1 blouse (3 marks)

(c) Use substitution method to solve the simultaneous equation (2 marks)

$2x + 3y = 600$

$x + 2y = 350$

20. (a) A farmer keeps cattle, goats and sheep in the ratio 6:2:3, the he decides to reduce the by $\frac{1}{4}, \frac{1}{2}$ and $\frac{1}{3}$ respectively. Find how many are left if initially there were 1452 animals in his farm? (3 marks)

(b) Ngari sold a mobile phone costing Sh. 3 800 at a profit. He earned a commission of 10% on the profit. Find the amount earned if he made a profit of 40%. (3 marks)

(c) The ratios $2:5$ and $8:x$ are equivalent. Find the value of x. (2 marks)

(d) A dress which was costing Sh. 1 400 now sells at 800. Determine the percentage change.
(2 marks)

21. Four ships are at sea, such that a steamliner **S** is 150km on a bearing of 025^0 from a cargo ship **C.** A trawler **T** is 300km on bearing of 145^0 from the cargo **ship C** and a Yacht **Y** is due west of **C** and on a bearing of 300^0 from **T.**
    a) Using a scale of $\mathbf{1}\boldsymbol{cm} = \mathbf{50}\boldsymbol{km}$ draw an accurate scale drawing showing the positions of **S,C,T and Y** (5 marks)

b) By measurement from your scale drawing determine

i. The distance and bearing of **Y** from **S** (3 marks)

ii. The distance **ST** (1 mark)

iii. The distance **YT** (1 mark)