ST. AMBROZIO SENIOR SECONDARY SCHOOL-KYENGEZA

UGANDA LOWER SECONDARY LEVEL EXAMINATIONS

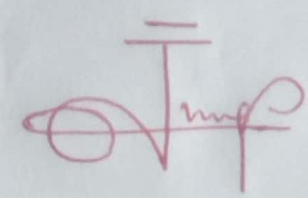
PROGRESSIVE ASSESSEMENT TERM ONE 2024

MATHEMATICS

S.4

TIME ALLOWED: 2HRS:15MINUTES

60/60



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Instructions to students:

- Attempt all questions.
- All responses must be written in the answer sheets provided.
- Neatness is a must.

Short answer Questions: (@04 scores)

1. A short boy of height 1.8m looks at his tall girlfriend's nice plated hair at an angle of 35°. How far is the boy from the girlfriend if the girlfriend is 3.5m tall?
2. Your friend is a trader. Last week, he bought goats at shs. 5 million and sold them to another buyer. After the sale, he was told to have made a profit of 25%.
   (a) Help him to find his profit's amount?
   (b) How much did he sell the goats?
3. Amza brought a question to you as a S.4 student about functions that if $f(x) = 10x + 2$ and $g(x) = 4x + 13$, determine the value of $g^{-1}f^{-1}(6)$. Give him the necessary assistance.
4. The school head girl was tasked to measure the heights in meters of five S.4 boys who always comes late to class. She got the following values.
   25.1, 24.8, 25.3, 26.3.
   She forgot to record the height of the fifth boy but only used it to calculate the mean height of the boys and she got 26 and presented it to the teacher. The teacher wants to know the heights of all the five boys. Without measuring again, help her to determine the height of the fifth boy.
5. On a certain bike trip in Uganda, a biker notes that he covers about 190km every 4 days. If he continues at this rate, determine how many kilometres he could bike in 2 days.
6. If you borrow 675,000 shillings from a bank that offers a simple interest at a rate of 10%. Given you will pay back after 6 years, find the amount accumulated?
7. Your father who studied maths a decade ago opened your maths book to check and found the statement below.
   Given that $OP = \binom{13}{17}$ and $OQ = \binom{5}{2}$. Calculate the length of PQ. Guide your father to understand this.
8. A rectangular room has a width of xcm and length of 3cm more than the width. Write down an algebraic expression in terms of x for;
   (a) Area of the rectangle
   (b) Show that $x^2 + 3x - 7 = 0$, if the room is $7cm^2$.
9. After the math lesson, Kintu started playing with his pencil and a graph book. He placed the rubber end of a pencil at point $(-1,7)$ and its tip at point $(5,9)$ on a graph paper. He mistakenly broke the pencil equally int two and placed the rubber end back at point $(-1,7)$ and left it laying in the same direction.
   (a) At what coordinates did Kintu's broken end of a pencil laid?- show your working
   (b) How long is Kintu's pencil now after breaking?- show your working
10. A father had 4 hectares of land and 2 sons. After the father's death, the 2 sons went into a disagreement on how to divide the land. The court found a will written by the father that "if i die,

divide my 4 hectares' land to my 2 sons, David and Ezra in the ratio of 2:3 respectively". If you were the one in charge, how will you divide the land?

Scenario Questions:

11. A number of communities are often threatened by malaria, cholera and typhoid. A survey was conducted by health workers in these communities and they found out that 50,50 and 40 respondents were worried about malaria, cholera and typhoid respectively.
    10 were worried about all the three diseases.
    15 about malaria and cholera.
    20 about cholera and typhoid and
    15 about malaria and typhoid.

Task:

(a) Using a Venn diagram, determine the number of respondents who were worried about;
   (i) Malaria only. (ii) Cholera only. (iii) Typhoid only.

(b) Find the total number of respondents in the survey?

(c) If the respondents were chosen at random, what were the chances of selecting a member who were affected by at least two diseases?

12. The scores obtained by 30 S.4 students in a mathematics test were as listed below.

30 40 35 32 62 73 94
81 80 79 30 40 62 80
32 35 73 94 81 35 30
40 32 79 79 94 62 79
62 73

Task:

a) Arrange the data above on a frequency distribution table using a class interval of 10 starting from 30.

b) Draw a histogram for the data and use it to estimate the modal score.

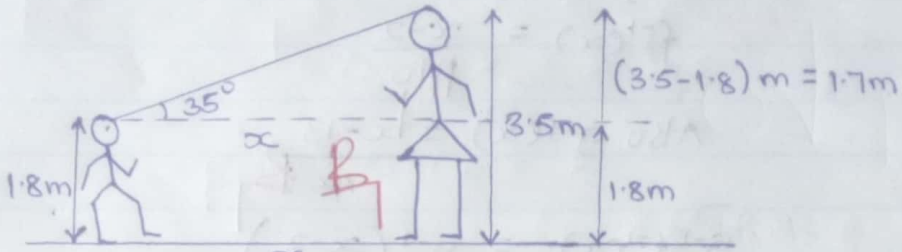
$$$$$$$$$$$$$ THE END $$$$$$$$$$$$$

"SUCCESS"

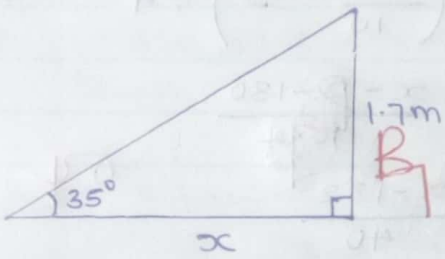
Compiled by Tr. Willy.

S.4 Mathematics
Marking guides

1.



Extracting



04

from $\tan 35° = \frac{1.7}{x}$ M_1

$x = \frac{1.7}{\tan 35°} = 2.43m$ A_1

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2. Given cost price = shs 5million
%tage profit = 25%

a) From %tage profit = $\frac{\text{profit}}{\text{cost price}} \times 100\%$ M_1

$25\% = \frac{\text{profit}}{5000000} \times 100\%$

04

profit = shs 25×50000
= shs 1,250,000 A_1

b) From profit = selling price − cost price B_1

1250000 = selling price − 5000000

Selling price = shs 1250000 + 5000000
= shs 6250000 A_1

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3. Given $f(x) = 10x + 2$

$g(x) = 4x + 13$

$g^{-1}f^{-1}(6) = ?$

$f^{-1}(x) = \frac{x-2}{10}$ M1

Also $g^{-1}(x) = \frac{x-13}{4}$ B1

$g^{-1}f^{-1}(x) = g^{-1}\left(\frac{x-2}{10}\right)$

$= \left(\frac{x-2}{10} - 13\right) \div 4$

$= \frac{x-2-130}{10 \times 4}$ B1

$= \frac{x-132}{40}$ 04

$g^{-1}f^{-1}(6) = \frac{6-132}{40}$

$= -3.15$ A1

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4. Let the height of the fifth boy be m.

$\frac{25.1 + 24.8 + 25.3 + 26.3 + m}{5} = 26$ M1

$101.5 + m = 5 \times 26$ B1

$m = 130 - 101.5$ B1 04

$m = 28.5$ A1

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5. 4 days = 190 Km M1

1 day = $\frac{190}{4}$ Km B1

2 days = $\frac{190 \times 2}{4}$ Km B1 04

$= 95$ Km A1

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6. $I = \frac{P \times R \times T}{100}$ M1

$= \frac{675000 \times 10 \times 6}{100}$ B1 04

= shs 405,000 B1

Amount = 675000 + 405000 = shs 1080 000 A1

7. $PQ = OQ - OP$

$= \begin{pmatrix} 5 \\ 2 \end{pmatrix} - \begin{pmatrix} 13 \\ 17 \end{pmatrix}$ M1

$= \begin{pmatrix} 5-13 \\ 2-17 \end{pmatrix}$ B1

$= \begin{pmatrix} -8 \\ -15 \end{pmatrix}$ 04

Length $PQ = \sqrt{-8^2 + (-15)^2}$ B1 $= 17$ units A1

8. Given width, $w = x$cm

Length, $l = (x+3)$cm

a) Area $= L \times w = x(x+3)\,cm^2$ M1

$= (x^2+3x)\,cm^2$ A1

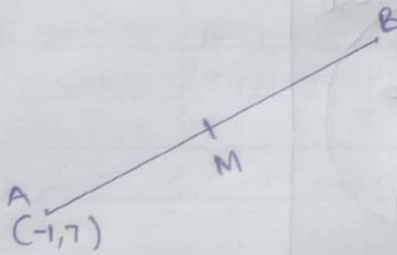
b) Area $= 7cm^2$

$(x^2+3x)\,cm^2 = 7cm^2$ M1

$x^2+3x = 7$

$x^2+3x-7 = 0$ A1 04

9.



a) Coordinates of $M\left(\frac{-1+5}{2}, \frac{7+9}{2}\right)$ M1

$M(2,8)$ A1

b) Length $AM = \sqrt{(x_2-x_1)^2 + (y_2-y_1)^2}$ M1

$= \sqrt{(2-(-1))^2 + (8-7)^2}$

$= \sqrt{9+1}$

$= 3.2$ units A1 04

10. Total ratio = 2+3 = 5 B1

David = $\frac{2}{5}$ × 4 hectares M1

= 1·6 hectares B1 04

Ezra = $\frac{3}{5}$ × 4 hectares

= 2·4 hectares B1

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11. a) Let M = malaria

C = cholera

T = typhoid

Given n(M) = 50

n(C) = 50

n(T) = 40 B3

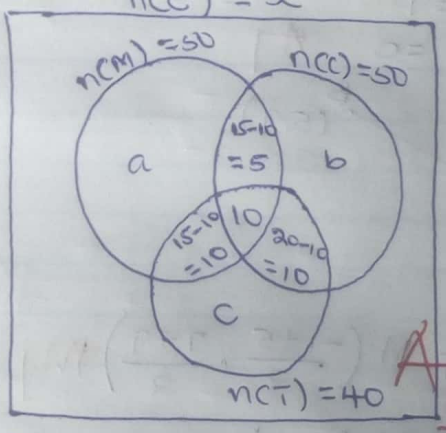
n(M ∩ C ∩ T) = 10

n(M ∩ C) = 15

n(C ∩ T) = 20

n(M ∩ T) = 15

n(ℰ) = x



A3

n(M) = a+5+10+10

50 = a+25

a = 25

n(C) = b+5+10+10

50 = b+25

b = 25

Also n(T) = C+10+10+10

40 = C+30

C = 10

i) 25 respondents
ii) 25 respondents C_3 10
iii) 10 respondents.

b) Total number of respondents = 25+5+25+10+10+10+10

= 95

c) P(atleast 2 diseases) = $\frac{5+10+10+10}{95}$

= $\frac{35}{95}$

= $\frac{7}{19}$ E_1

12. a)

Scores	Tally	f	Class boundaries
30-39	|||||	9	29.5 - 39.5
40-49	|||	3	39.5 - 49.5
50-59		0	49.5 - 59.5
60-69	||||	4	59.5 - 69.5
70-79	|||||	7	69.5 - 79.5
80-89	||||	4	79.5 - 89.5
90-99	|||	3	89.5 - 99.5
		Σf = 30	

12 (b) Mode = 29.5 + 6

= 35.5

10

UGANDA NATIONAL EXAMINATIONS BOARD

(To be fastened together with other answers to paper)

UACE

Candidate's Name .....

Signature .....

Subject Name ..... No. 12 (b) ..... Paper code ...../.....

Random No.					
Personal Number