

PRESIDENT'S OFFICE
REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT – RALG

COAST REGION

REGIONAL FORM FOUR SECONDARY EDUCATION MOCK EXAMINATION 2020

041

BASIC MATHEMATICS

Time: 3 Hours

Thursday, 13th August 2020 a.m

Instructions

1. This paper consists of section A and B.
2. Answer all questions in section A and B. each question in section A carries six (6) marks while each question in section B carries ten (10) marks).
3. All necessary working and answers for each question must be shown clearly.
4. Cellular phones and any unauthorized materials are not allowed in the examination room.
5. Mathematical tables and non-programmable calculators may be used.
6. Write your examination number on every page of your answer booklet(s).

This paper consists of four printed pages

Page 1 of 4

SECTION A (60 Marks)

Answer all questions in this section.

1. (a) In a class of 40 students, $\frac{3}{4}$ are boys. Two fifths of the girls wear mask. How many girls do not wear mask?
(b) If $x = 0.35$ and $y = 0.18$ find $x + y$
2. (a) Evaluate $\log 900$ given that $\log 2 = 0.3010$, $\log 3 = 0.4771$ and $\log 5 = 0.6990$
(b) Given that $a^{2n} = 2$, evaluate $5 - 6a^{6n}$
3. (a) In a class of 30 students, 20 students are taking physics, 12 are taking both chemistry and physics. How many students in the class take chemistry only if 8 students take neither physics nor chemistry?
(b) A class has 12 boys and 4 girls. If three students are selected at random from the class, what is the probability that they are all (i) Boys (ii) Girls?
4. (a) Point P lies on the x-axis and it's equidistant from point A(8, 4) and B(6, 6). Find the coordinates of P.
(b) Given vector $\underline{a} = \frac{1}{2}\underline{i} + \frac{1}{3}\underline{j}$, $\underline{b} = \frac{2}{3}\underline{i} + \frac{1}{3}\underline{j}$ and $\underline{c} = \underline{i} + 6\underline{j}$
(i) Determine a unit vector in direction of vector \underline{d} where $\underline{d} = 6\underline{a} + 3\underline{b} - \underline{c}$
(ii) Find the resultant of vectors.
5. (a) The area of triangle is 38 cm^2 . After an enlargement the area is 9.5 cm^2 . Find the scale factor of the enlargement.
(b) Find the length of one side and perimeter of a regular polygon having 7 sides inscribed in a circle of radius of 10 cm.
6. (a) The price of jeans in USA is US dollar 67 and in London the same jeans costs Euro 47.50. if the exchange rate is 1 Euro is equivalent to 1.34 US dollars, work out the difference between the cost of the jeans in USA and in London. Give your answer in Euros.
(b) The time (t days) required to build a house is inversely proportional to the number of builders (n), all working at the same rate. If there are 6 builders it takes 80 days to complete the house. How many builders must be employed to build the same house in just 16 days?
7. (a) A bicycle was bought at Tsh. 140,000/= and then sold at a loss of 12%. What was its selling price?
(b) From the following data of Mr. Mushikwa (trader) prepare final accounts trading, profit and loss account for the year ended 31st march 2019.

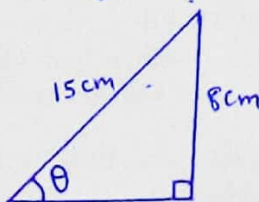
Sales	2400
Purchase	700
Stock at start	1000
Stock at end	600
Rent	200
Wages	200
Rates	400
Insurance	100
Repairs	300

8. (a) If 6, x, y and 15 are consecutive terms of an A.P. Calculate the value of x and y. Hence, identify common difference.

(b) Find the sum of the first five terms of the series below;
 $9 + 27 + 81 + \dots$

9. (a) A 3 cm ladder has its foot 2 m from the base of vertical wall. How far up the wall does the ladder reach?

(b) In the figure below find the value of angle θ



10. (a) Use the quadratic formula to solve $x^2 - 2x - 24 = 0$

(b) If $a - b = \sqrt{13}$ and $a^2 + b^2 = 25$ find the value of ab.

SECTION B (40 Marks)

Answer all questions in this section

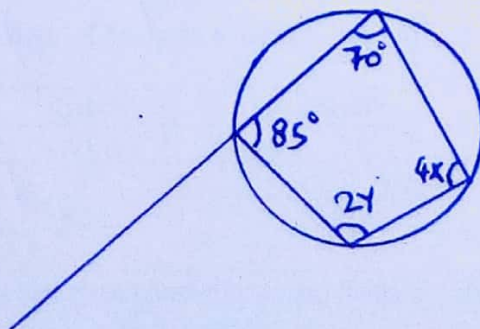
11. (a) The marks for basic mathematics of 100 students are distributed as shown below;

Marks	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69
Number of students	4	6	10	14	X	20	14	6

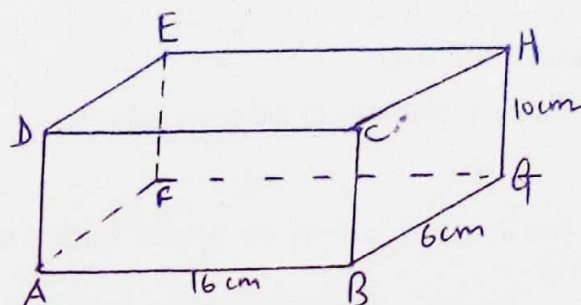
- (i) Find the value of x
- (ii) Calculate the mean mark
- (iii) Draw the histogram to represent the data

(b) (i) Prove that "the opposite angles in cyclic quadrilateral are supplementary".

(ii) Determine the value of x and y in the figure below.



12. (a) The figure below show a rectangular box in which $AB = 16$ cm, $HG = 10$ cm and $BC = 6$ cm. Find:



- The length AG
- The length of diagonal AH
- The angle AH makes with the base ABGF
- The angle EABH makes with the base ABGF.

(b) Calculate the distance between $P(120^\circ\text{S}, 40^\circ\text{W})$ and $Q(65^\circ\text{S}, 40^\circ\text{W})$. Express your answer in; (i) kilometers (km) (ii) nautical miles (nm)

(c) Calculate the total surface area of a cone whose slanting height is 12 cm and has the base radius of 10 cm.

13. (a) (i) Given matrices $A = \begin{bmatrix} 3 & 1 \\ 5 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} -2 & 4 \\ 0 & 6 \end{bmatrix}$, find $3A - \frac{1}{2}B$

(ii) Given that matrix $Q = \begin{bmatrix} 3x & 4 \\ -2 & 6 \end{bmatrix}$ and $|Q| = 5$, find the value of x

(b) Solve the following system of linear equations by using Cramer's rule.

$$\begin{cases} 3x + y = 14 \\ 2x - y = 1 \end{cases}$$

(c) The point $(-4, 1)$ is first reflected along x -axis followed by rotation about the origin in 90° anticlockwise, find the coordinate of the final image.

14. (a) A function f is a quadratic one and it passes through $(0, 2)$, $(1, 6)$ and $(-3, 2)$. Find function f .

(b) Given the function $f(x) = 2|x|$, sketch the graph of $f(x)$.

(c) The number of units of protein and starch obtained by each of two foods A and B are shown below;

	Protein	starch	Cost per bag
A	8	10	Tsh. 400/=
B	12	6	Tsh. 500/=
Minimum daily requirement	32	22	

What is the cheapest way of satisfying the minimum daily requirements?