

MINISTRY OF EDUCATION AND HIGHER EDUCATION

FORM FOUR EXAMS, 2021

MATHEMATICS



P/LAND NATIONAL EXAMINATION BOARD

MINISTRY OF EDUCATION AND HIGHER EDUCATION
PUNTLAND NATIONAL EXAMINATIONS BOARD

Code Number

FORM FOUR EXAMINATION, 2021
TIME: 2 HOURS AND 10 MINUTES FOR READING

MATHEMATICS

Instructions to candidates

- Answer all the questions
- This paper consists of 11 pages, count it and if any is missing inform your invigilator
- Do not write your **name and roll number** on the exam paper
- Make sure that **student's profile** is attached to the exam paper, if not, inform you invigilator.
- No extra paper is allowed.
- If you make a mistake, **cross out the incorrect** answer and **write your correct answer**.

This exam paper consists of following parts

Parts	Marks
Part one:	10 marks
Part two:	50 marks
Part three:	40 marks
Total: 100 Marks	

For the markers only

PARTS	MARKS
Part one	
Part two	
Part three	
TOTAL	%



SOM EXAMS

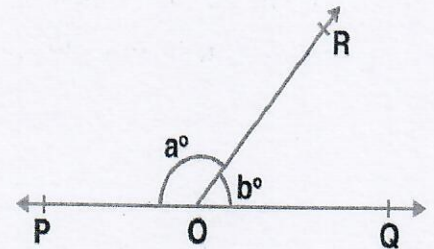
Part one:- Choose the correct answer (10 marks)

1) $(a + b)^2 + (a - b)^2$ is equal to

- A. $a^2 + b^2$
- B. $2a^2 + 2b^2$
- C. $a^2 - b^2$
- D. $2a^2 - 2b^2$

2) The sum of angle a and angle b is

- A. 120°
- B. 100°
- C. 90°
- D. 180°



3) If the universal set $\xi = \{2, 4, 6, 8, 10, 12\}$ and set $A = \{2, 8, 12\}$.

The complementary of set A is

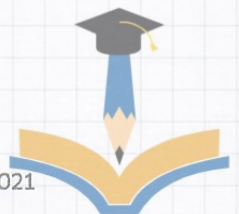
- A. $\{2, 4, 6\}$
- B. $\{4, 6, 10\}$
- C. $\{2, 4, 8\}$
- D. $\{4, 6, 10\}$

4) Converting $\frac{3}{4}\pi$ radian into degree is equal to

- a. 125°
- b. 145°
- c. 135°
- d. 155°

5) $\sqrt{63} - \sqrt{28}$ is equal to

- A. $\sqrt{7}$
- B. $2\sqrt{7}$
- C. $3\sqrt{7}$
- D. $4\sqrt{7}$

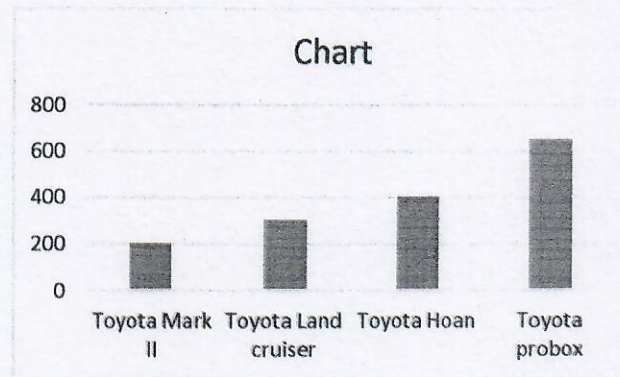


6) Simplifying of $\frac{24x^4}{12x^3}$ is equal to

- A. $2x^2$
- B. $3x^2$
- C. $2x$
- D. 2

7) The bar chart shows the cars used in Puntland
Modal car in Punt land is

- A. Toyota Mark II
- B. Toyota Land cruiser
- C. Toyota Hoan
- D. Toyota probox



8) 9P_2 is equal to

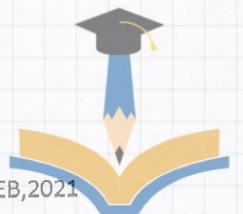
- A. 72
- B. 56
- C. 63
- D. 45

9) Which of the following fractions is equivalent to 0.75

- A. $\frac{3}{2}$
- B. $\frac{4}{5}$
- C. $\frac{3}{4}$
- D. $\frac{3}{5}$

10) If $f(x) = \frac{x+3}{2x}$ then $f(3)$ is equal to

- A. 3
- B. 1
- C. 6
- D. 2



Part two:- Basic mathematics (50 marks)**(Answer all the questions, write your work in the space provided)****Question 1**

- a) Express as percentage (2 marks)
 $\frac{45}{50} =$
- b) $\log 3 = 0.4471$. find $\log 27$ (2 marks)
- c) Expand and simplify $-2x(3x^3 - 4x + 2) + 3x - 1$ (2 marks)
- d) Solve $\frac{2x-1}{3} = \frac{2x+1}{5}$ (2 marks)
- e) A total of 250 students came to a school. If 160 of them were boys, what is the percentage of the boys (2 marks)

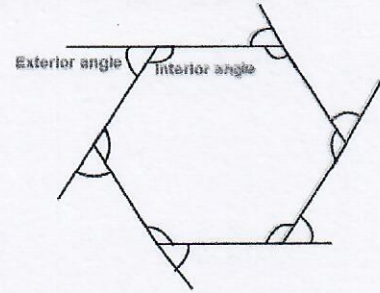
Question 2

- a) Three Brothers Ali, Osman and Fatima invested \$9 000, \$ 15 000, and \$ 6 000 respectively in a small business. They agreed to share any profit in the ratio of their investments.
- i) Write this ratio in the form $a : b : c$ as simple as possible. (2 marks)
- ii) After one year they made \$ 2500 profit. How much did Ali receive? (2 marks)
- iii) How much did Fatima get? (2 marks)



b) Calculate the size of an **interior angle** of a regular pentagon

(2 marks)



c) Find the size exterior angle of the above pentagon

(2 marks)

Question 3

a) Bashiir scored the following marks 9, 7, 8, 15, 12, 9 and 17 in 7 tests.

i) Find the mean for the set of data.

(2 marks)

ii) Find the median of the data

(2 marks)

iii) What is the mode of the data

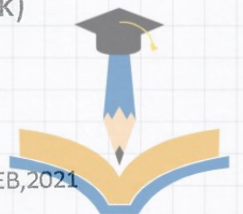
(1 mark)

b) A day is chosen from a week.

i) Find the probability of selecting a day starting with the letter S. (2marks)

ii) Find the probability of selecting a day starting with the letter W. (2 marks)

iii) Find the probability of selecting a day starting with the letter Q. (1 mark)



Question 4

a) Solve this inequality and write its solution set

$$4x - 5 \geq x + 4$$

(3 marks)

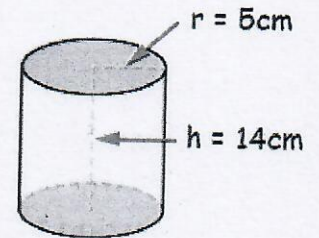
b) Solve this quadratic equation

$$x^2 + 5x + 6 = 0$$

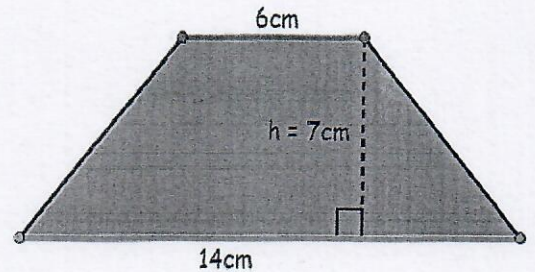
(2 marks)

c) Find the volume of the cylinder below

(2 marks)



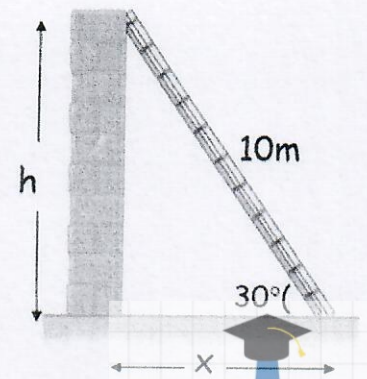
d) Find the area of the trapezium below (3 marks)



Question 5

a) A ladder lean against a wall as shown in figure below

i) Find the height of the wall ($\sin 30^\circ = \frac{1}{2}$) (3 marks)



- ii) Find the length of side marked **X** (2 marks)
 (Use Pythagoras theorem ONLY)

- b) Sahra buys a goat at 90, 000 sh and sell 117, 000 sh
 i) Find her profit (2 marks)

- ii) Find her percentage profit (3 marks)

Part 3:- Structured questions (40 marks)

(Answer all the questions; write your work in the space provided)

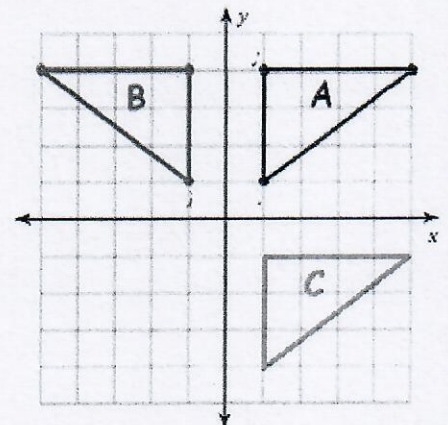
Question 1

- a) In the diagram on the right

- i) Triangle C is formed after translating triangle A by a column vector of $\begin{pmatrix} \quad \\ \quad \end{pmatrix}$ (2 marks)

- ii) Describe the single transformation which maps triangle B from triangle A (2 marks)

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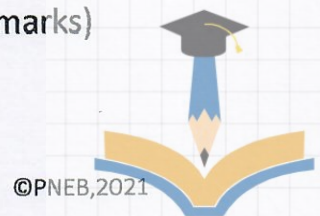


Question 2

- b) Given vector $\mathbf{a} = \begin{pmatrix} 3 \\ 4 \end{pmatrix}$ and vector $\mathbf{b} = \begin{pmatrix} -2 \\ 2 \end{pmatrix}$. Find

- i) $\vec{a} + \vec{b} =$ (3 marks)

- ii) Magnitude of vector a (3 marks)
 $|\vec{a}| =$

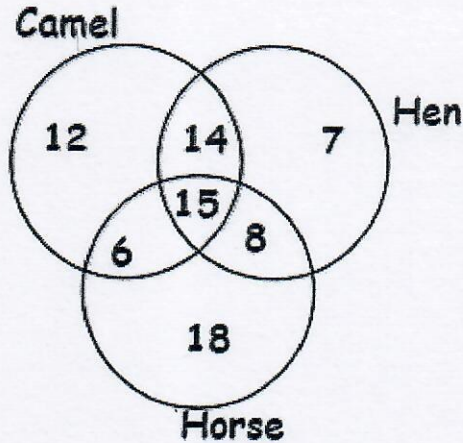


Question 3

a) Students in Grade 4 are asked about whether they like Camel, Horse or Hen .
students like at least 1 of the animals.

All

The venn diagram below represents the information obtained



- i) How many students like all three animals (1 mark)
- ii) How many students like ONLY camel (1 mark)
- iii) How many students like both camel and horse only (1 mark)
- iv) What is the total number of students in grade 4 (2 marks)

Question 4

Given these complex numbers $(12 + 3i)$ and $(4 - 3i)$

- a) Multiply (3 marks)
 $(12 + 3i)(4 - 3i) =$

- b) Add (2 marks)
 $(12 + 3i) + (4 - 3i) =$



Question 5

a) Given the function $y = x^3 - 2x^2 - 9x$

Find the gradient of the function when $x = 0$

(2 marks)

b) Find $\int_1^2 (4x^3 + 6x^2 + 2x)$

(3 marks)

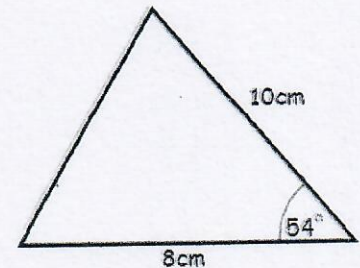
Question 6

a) Find the area of the triangle below

(3 marks)

($\sin 54 = 0.8$)

(2



b) Prove the identity
marks)

$$\sin\theta \cot\theta \equiv \cos\theta$$

Question 7

Using the cumulative frequency graph estimate:

a) The lower quartile (1 marks)

.....

b) The median (1 marks)

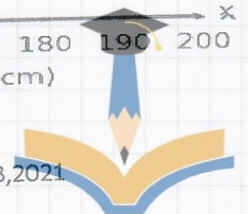
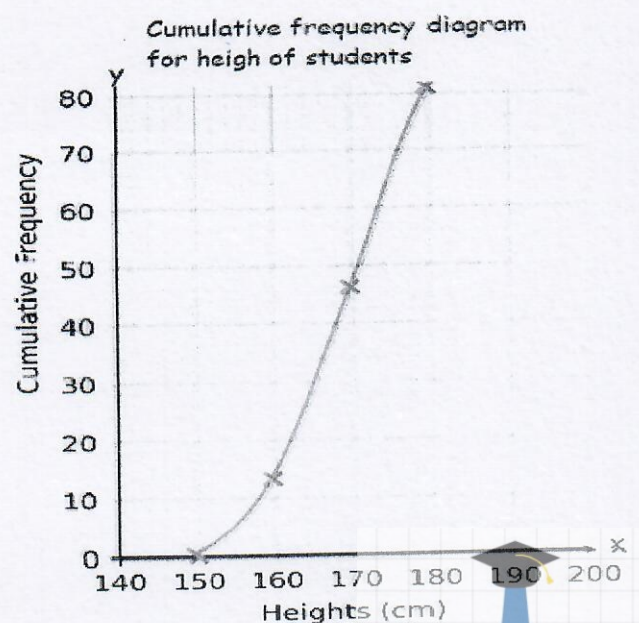
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c) The upper quartile (1 marks)

.....

d) Calculate the inter quartile range (2 marks)

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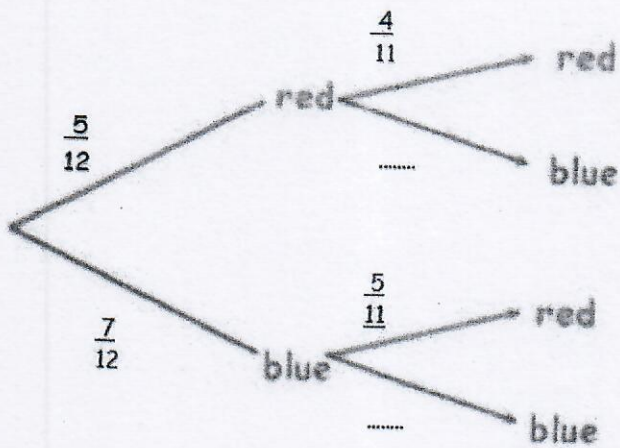


Question 8

A bag contains 7 blue and 5 red marbles. you have chosen two marbles at random without replacement.

The tree diagram shows the various possibilities.

- a) Complete the tree diagram (2 marks)



- b) Find the probability that the two marbles are same color. (3 marks)

END



