

MINISTRY OF EDUCATION AND HIGHER EDUCATION

FORM FOUR EXAMS, 2017

MATHEMATICS



P/LAND NATIONAL EXAMINATION BOARD

**MINISTRY OF EDUCATION AND HIEGHER EDUCATION
PUNTLAND NATIONAL EXAMINATIONS BOARD**

Code Number

**Form four EXAMINATION 2017
Time 2 hours AND 10 minutes for reading**

Mathematics

Instructions to candidates

- Answer all the questions
- This paper consists of 15 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. Rough work can be done on page 1. This will not be marked.
- If you make a mistake, **cross out the incorrect answer and write your correct answer.**

This exam paper consists of following Sections

Parts	Marks
Section A: Basic mathematics	40 marks
Section B: Answer ALL questions	60 marks
Total: 100 Marks	

For the markers only

PARTS	MARKS
Section A	
Section B	
TOTAL	%



SOM EXAMS

Use this page for rough work, it will not be marked.



Section A:- Basic mathematics**40 marks****Part one: Circle the letter of the correct answer (10 marks)**

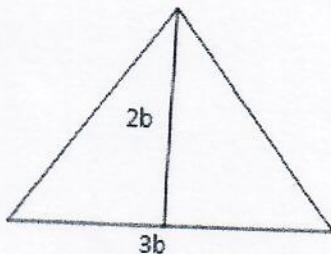
- 1) The HCF of 24, 42 and 36 is
 - a) 16
 - b) 8
 - c) 12
 - d) 6
- 2) $\left(\frac{2}{3} + 0.5\right) \frac{3}{5}$ is equal to
 - a) $\frac{7}{10}$
 - b) $\frac{21}{30}$
 - c) $\frac{7}{30}$
 - d) $\frac{10}{11}$
- 3) $-a(a - b)^2$ is equal to
 - a) $-a^3 + ab^2$
 - b) $-a^3 + a^2b + ab^2$
 - c) $-a^3 + 2a^2b - ab^2$
 - d) $-a^3 - 2a^2b - ab^2$
- 4) The value of y in the equation $\frac{3}{4}y = 9$ is
 - a) 36
 - b) 18
 - c) 15
 - d) 12
- 5) $\sqrt{45} - \sqrt{20}$
 - a) $5\sqrt{5}$
 - b) $6\sqrt{5}$
 - c) $2\sqrt{5}$
 - d) $\sqrt{5}$

6) Writing in stand form 0,00234 is

- a) 2.34×10^{-2}
- b) 2.34×10^{-1}
- c) 2.34×10^{-3}
- d) 2.34×10^2

7) the area of triangle below is

- a) $6b^2$
- b) $4b^2$
- c) b^2
- d) $3b^2$



8) Converting in km 123,000 cm is equal to

- a) 123 km
- b) 12.3 km
- c) 1.23km
- d) 0.123km

9) The gradient and y intercept of the line $6x - 3y - 9 = 0$ is

- a) $M = 2$ and $C = -3$
- b) $M = -2$ and $C = 3$
- c) $M = 3$ and $C = 2$
- d) $M = 2$ and $C = 3$

10) The median of this set of data 5, 3, 4, 6, 2, 7, 8 is

- a) 5
- b) 6
- c) 3
- d) 3

Part two:- Structured question (30 marks)**Answer ALL questions****Question 1**

a) Solve $3(2x - 1) + 2(x - 5) = 3$

(3 marks)

b) Solve by factorization only $x^2 - 6x + 8 = 0$

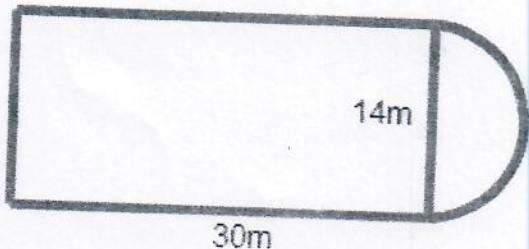
(3 marks)

c) if $q = 2, p = -1$ and $y = -3$ find the value of $q(py - y)^2$ (3 marks)

Question 2

Sharma'arke has a garden, the shape of the garden is shown below

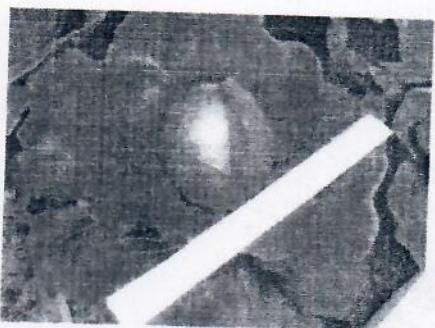
- a) Find the perimeter of this garden (2 marks)



- b) He want to fence his garden by rolls of wire mesh,
if one roll fences 10m how many rolls he needs (1 mark)

- c) Calculate the area of the garden (3 marks)

- d) He wants to plant cabbage, if one cabbage needs 700cm^2
How many cabbages he can plant (2 mark)

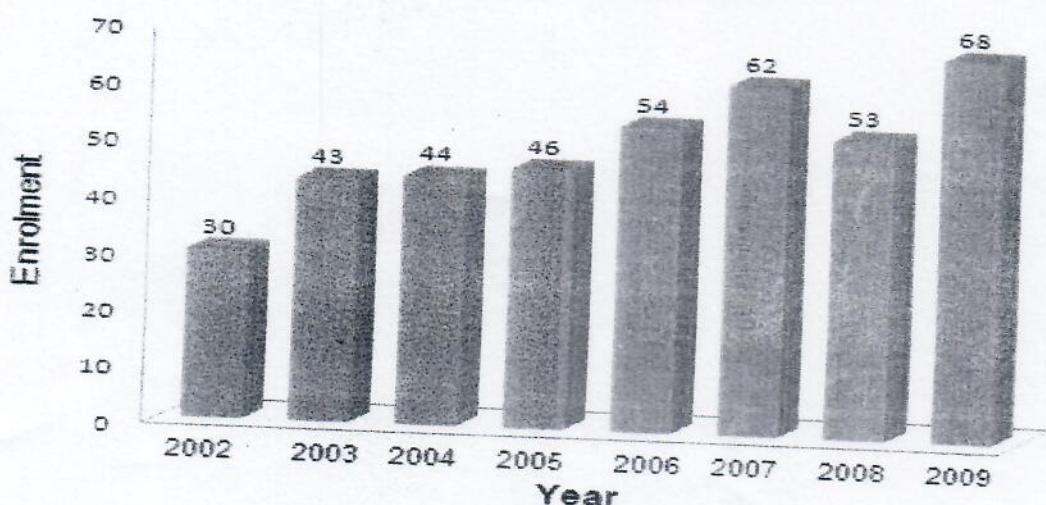


Question 3

A farmer harvest 50 tones of maize if his production increase 10% on the last year how many tones he harvested the last year
 (2 marks)

Question 4

This bar graph shows primary G 7 enrolments in a school



- Which year had the highest enrolment for G7? (1 mark)
- Find the difference between the highest and lowest enrolment? (1 marks)
- Calculate the mean of enrolment (2 marks)

Question 5a) $\frac{2\pi}{3}$ Change into degree

(2 marks)

b) $\log_2 8 = x$ find the value of x

(2 marks)

d) Simplify

(3 marks)

$$\left(2\frac{2}{3} - \frac{1}{3}\right) + \left(\frac{3}{4} - \frac{1}{2}\right) =$$

Section B:- Answer ALL questions

(60 marks)

Question 1**a) Evaluate**

i) ${}^7P_3 =$

(2 marks)

ii) $\int_1^3 (8x^3 - 6x^2 + 8x - 5)dx =$

(3 marks)

b) Simplify the following complex numbers

i) $(5 - 3i)(5 + 3i)$

(2 marks)

ii)
$$\frac{(2+3i)}{(2-2i)}$$

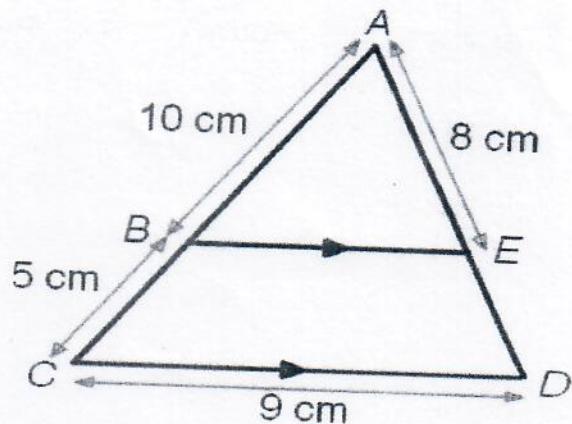
(3 marks)

Question 2

- a) Triangles ABE and ACD are similar
 i) Calculate the length of BE (2 marks)

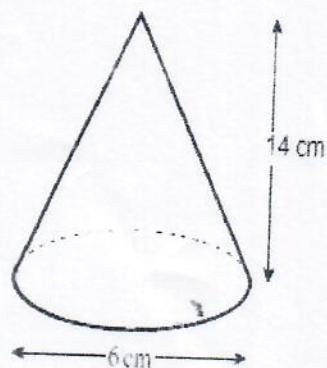
- ii) Calculate the length of DE (2 marks)

- iii) Find the trapezium EBCD (1 mark)



- b) Calculate the volume of the cone below

(2 marks)



Question 3

The table below gives information about number of minutes pupils spend on homework.

a) Complete the table

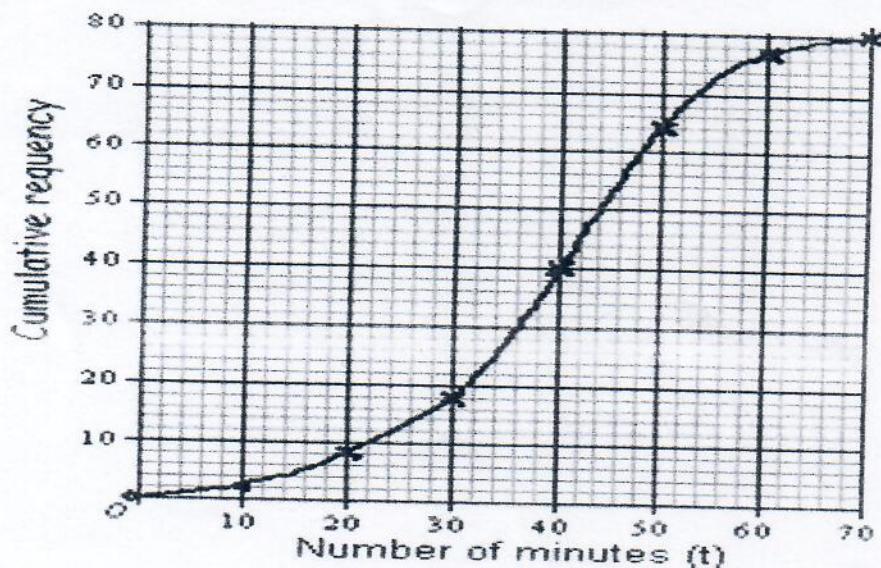
(6 marks)

Number of minutes (t)	Mid-point (x)	Frequency (f)	fx	Cumulative frequency CF
$0 < t \leq 10$	5	2	10	2
$10 < t \leq 20$	15	6	80	8
$20 < t \leq 30$		10		
$30 < t \leq 40$		22		
$40 < t \leq 50$		24		
$50 < t \leq 60$		13		
$60 < t \leq 70$	65	3	195	80
		$\sum f = \dots$	$\sum fx = \dots$	

b) Calculate the mean

(2marks)

c) Use the cumulative frequency graph to estimate



i) Lower quartile $\approx \dots$ (1 mark)

ii) Upper quartile $\approx \dots$ (1 mark)

iii) Median $\approx \dots$ (1 mark)

d) Calculate inter quartile range (1 mark)



Question 4

- a) A basketball coach must choose 5 player from a team of 9 players. In how many ways he can select the 5 players? (3 marks)
- b) What is probability of selecting letter S from the letters of the word STATISTICS ? (2marks)
- c) If $f(x) = \frac{3x+2}{2x}$ and $g(x) = 4x - 2$
- find $fg(-1)$ (3marks)
 - Find $g^{-1}(x)$ (3marks)

Question 5

If the equation of a parabola is $y = 3x^2 - 18x + 24$

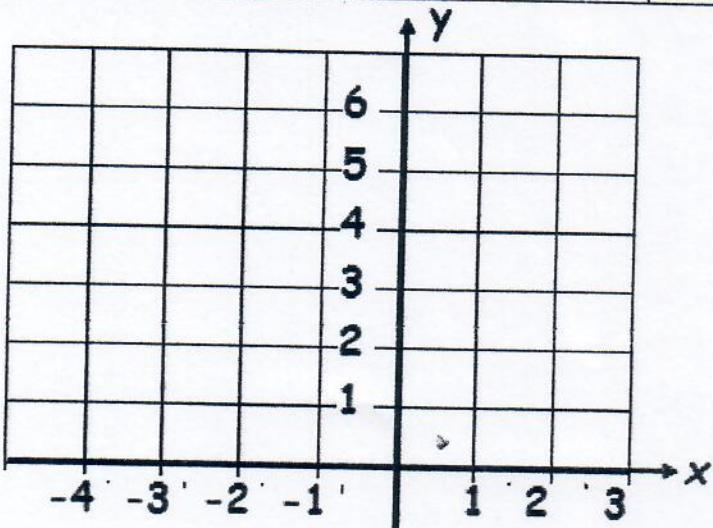
- a) Find the gradient(slope) of the parabola when $x = -3$ (2 marks)

- b) Find the stationary point of the parabola and determine whether is minimum or maximum point (4 marks)

- c) Use the below table to draw the graph of $y = -x^2 - x + 6$

(2marks)

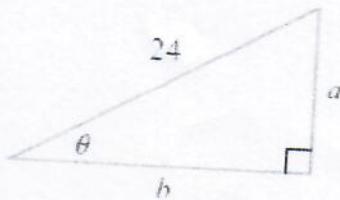
X	-3	-2	-1	0	1	2
y	0	4	6	6	4	0



Question 6

a) Express the lengths b in the figure in terms of θ .

(2 marks)



b) Find irrational value of $\sin 105^\circ$

(3 marks)

$$(\text{given } \sin 45^\circ = \cos 45^\circ = \frac{1}{\sqrt{2}}, \sin 60^\circ = \frac{\sqrt{3}}{2} \text{ and } \cos 60^\circ = \frac{1}{2})$$

c) Prove that $\frac{2\tan\theta}{1+\tan^2\theta} = \sin 2\theta$

(3 marks)



Question

a) Find the radius of a circle that has center $(-1, 4)$ and passes through the point $(3, -2)$

(hint use distance formula) $r^2 = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ (2 marks)

b) Find the full equation of the circle

(3 marks)

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Use this page for rough work, it will not be marked.

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