MINISTRY OF EDUCATION AND HIGHER EDUCATION

FORM FOUR EXAMS, 2018

# MATHEMATICS

2018

P/LAND NATIONAL EXAMINATION BOARD

# MINISTRY OF EDUCATION AND HIGHER EDUCATION
# PUNTLAND NATIONAL EXAMINATIONS BOARD

Code Number

**Form four EXAMINATION 2018**
**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. 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 parts**

| Parts | Marks |
|---|---|
| **Section A** | |
| Part one: Multiple choice | 10 marks |
| Part two: Structured Questions | 30 marks |
| **Section B**: Structured Questions | 60 marks |
| | **Total: 100 Marks** |

For the markers only

| PARTS | MARKS |
|---|---|
| **Section A** | |
| Part one: Multiple choice | |
| Part two: Structured Questions | |
| **Section B**: Structured Questions | |
| TOTAL | % |

**Use this page for through 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 sum of the first four multiples of 3 is
   a) 45
   b) 30
   c) 24
   d) 90

2) $\frac{(-2)\times 30}{-3}$ is equal to
   a) - 30
   b) - 20
   c) 30
   d) 20

3) $y^2 \times y^{1/3}$ is equal to
   a) $y^{7/3}$
   b) $y^{5/3}$
   c) $y^{-6/3}$
   d) $y^{4/3}$

4) The product of these complex numbers $(5-7i)(5+7i)$ is
   a) 47
   b) 25 - 49i
   c) 25 + 49i
   d) 74

5) A piece of wood is 60m long and cut into the ratio of 3 to 2 . the length of the longer piece will be
   a) 15m
   b) 30m
   c) 36m
   d) 24m

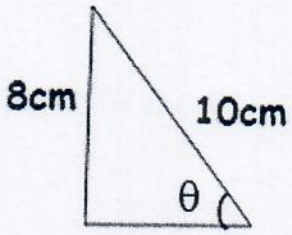
6) In the triangle below $Sin\theta$ is equal to

a) $\frac{5}{2}$

b) $\frac{10}{8}$

c) $\frac{3}{2}$

d) $\frac{4}{5}$




7) If 8 shirts cost $28, how much is the cost of 4 shirts?

a) 12
b) 16
c) 14
d) 20

8) There are 6 colored marbles in a box which are 4 Red and 2 Yellow. The probability of drawing a **Red** marble is

a) $^2/_3$

b) $^1/_6$

c) $^4/_3$

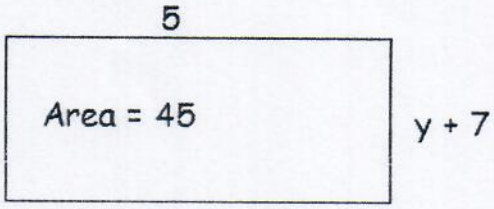
d) $^1/_3$

9) $\frac{7!}{5!}$ is equal to

a) 49
b) 42
c) 35
d) 13

10) The value of y in the rectangle below is

a)2
b)6
c)3
d)4



## Part two:- Structured questions ( 30 marks)

### Question 1

a) Simplify (3 marks)

$$\left(\frac{4}{5}-\frac{3}{4}\right) \div 1\frac{2}{3} =$$

b) Expand and simplify ( 3 marks)

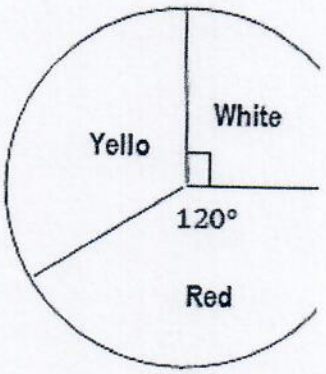
$7(2x - y) - 3(3x - 3y) =$

c) If $f = \frac{g^2}{y}$ calculate the value of **g** when **f = 16 and y = 4** (2 marks)

d) If $\log 2 = 0.3010$ and $\log 3 = 0.4771$ find $\log 6$ (3 marks)

## Question 2

The pie chart show colors of 240 cars in a park



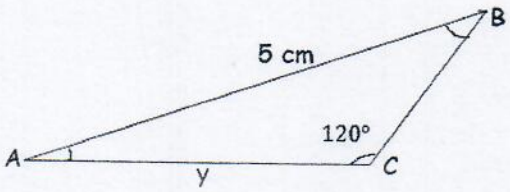

a) The sector angle for white cars is 90°. Calculate the number of white cars (2 marks)

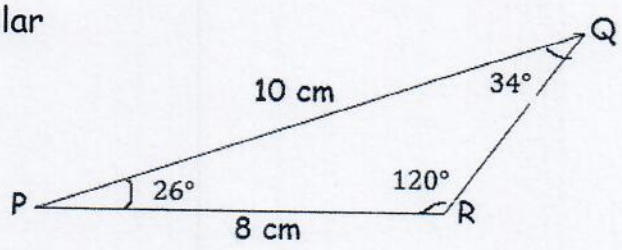
b) find the number of red cars (2 marks)

c) Find the number of yellow cars (2 marks)

## Question 3

The two triangle ABC and PQR are similar



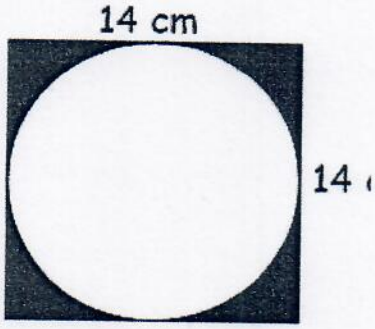




a) Calculate the length of side **y** *(2marks)*

b) Write the size of angle A ( 1 mark)

c) The figure below shows a circle fit inside of a square

i) Find the radius of the circle (1 mark)




ii) Calculate the shaded area (3 marks)

## Question 4

a) Dahir and Dahaba Share $ 360 in the ration of 4 : 5. How much should each get

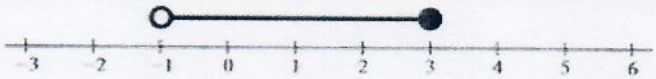
i) Dahir's share (1 mark)

ii) Dahabas' share (1 mark)

b) Solve the equation (2 marks)

$$\frac{x+1}{2} = \frac{x}{3}$$

c) Write the solution set of the inequality shown on the number line (2 marks)

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## *Section B: Structured Questions (60 marks)*

### Question 1

The table below shows marks scored by 15 students in a test

a) Complete the table (3 marks)

| Score ( x ) | Frequency ( f ) | fx |
|---|---|---|
| 60 | 3 | |
| 65 | 2 | |
| 70 | 5 | |
| 72 | 2 | |
| 80 | 3 | |
| | $\sum f = 15$ | $\sum fx =$..... |

b) Which is the modal score? (1 mark)

c) Calculate the mean ( 3 marks)

### Question 2

a) Solve by formula **ONLY** $4x^2 + 12x + 9 = 0$ (3 marks)

b) Evaluate $\log_{10} 5 + \log_{10} 60 - \log_{10} 3$ (2 marks)

**Question 3**

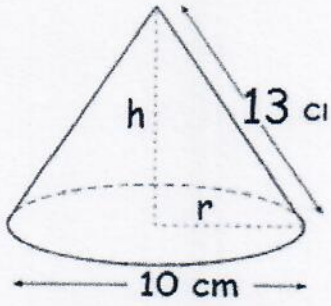
A particle moves so that its velocity in m/s is given by $V(t) = 6t^2 - 2t + 3$

a) Find its acceleration after 3 sec (2 marks)

b) Find distance covered by the particle between t= 1sec and t= 3sec (3 marks)

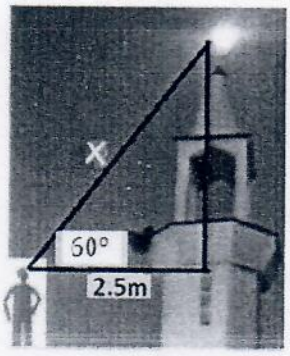
**Question 4**

a) Calculate the height of the cone below (2 marks)



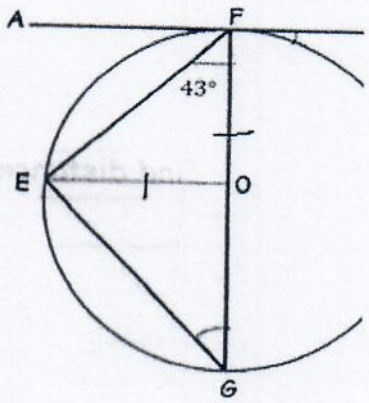

b) Calculate the volume of the cone (3 marks)

c) The picture shows a person looking a minaret of a mosque that the moon apart the top of the minaret. If the angle of elevation (angle from the person to the top of the minaret) is $60°$ and the horizontal distance between the person and minaret is 2.5m, Find the short distance ( x) between the person and the top of minaret (3mrks)



## Question 5

In the diagram below AB is the tangent of the circle, FG is the diameter and O is the center of the circle. Find the size of the angles (state geometrical reason in each case)




a) $\angle$ BFG or $\angle$ y (2 marks)

b) $\angle$ EOF (2 marks)

c) $\angle$ FEG (2 marks)

d) $\angle$ EGF (2 marks)

## Question 6

Given that the vectors $\boldsymbol{a} = \begin{pmatrix} 1 \\ -5 \end{pmatrix}$ and $\boldsymbol{b} = \begin{pmatrix} -4 \\ 8 \end{pmatrix}$. Find

a) $\boldsymbol{a} - \frac{1}{2}\boldsymbol{b} =$ (3 marks)

b) Length or magnitude of b (2 marks)

$|b| =$

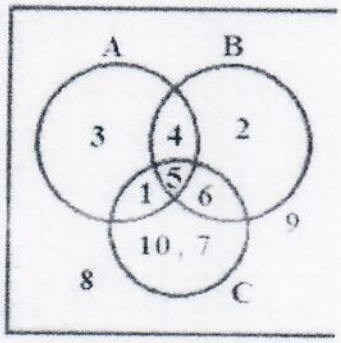
## Question 7

a) Expand using binomial theorem $(3x + y)^5$ (3 marks)

b) In how many ways you can arrange the letters in the word ZEYLAC taken 2 letters at a time? (2 marks)

## Question 8

From the venn diagram on the right. Find the following sets




a) $A \cap C = \{\ldots\ldots\ldots\ldots\}$ (1 mark)

b) $A \cup B = \{\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\}$ (3 marks)

c) *complemantary of* $(A \cup B \cup C)$

$\overline{A \cup B \cup C} = \{\ldots\ldots\ldots\ldots\ldots\ldots\}$ (1mark)

d) Describe the universal set in words (1 marks)

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## Question 9

Given the following set of data 6, 12, 13, 5, 15, 18, 22, 50

a) Find the median (2 marks)

b) Find the Lower quartile Q1 (1 mark)

c) Find the upper quartile Q3 (1 mark)

d) Calculate

i) Inter quartile range (1 mark)

ii) Quartile deviation (1 mark)

## Question 10

If $\frac{x^2}{36} + \frac{y^2}{25} = 1$ is the equation of an ellipse

a) Find the coordinates of two foci (3 marks)

b) Find the length of the major axis (2 marks)

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