

MINISTRY OF EDUCATION AND HIGHER EDUCATION

FORM FOUR EXAMS, 2014

MATHEMATICS



P/LAND NATIONAL EXAMINATION BOARD

PUNTLAND STATE OF SOMALIA
MINISTRY OF EDUCATION
NATIONAL EXAMINATIONS BOARD

NAME OF THE STUDENT	
NAME OF THE SCHOOL	
ROLL NUMBER	

FORM FOUR MATHEMATICS EXAMINATION MAY 2014

TIME 2:10 HOURS

INSTRUCTIONS TO CANDIDATES

Instructions to the candidate (please read carefully)

This paper consist of 16 pages, count now, if there is missing please inform to the invigilator

- Answer ALL questions
- Write your working on the space provided below the question
- No allowed extra paper. No allowed calculators
- If you write wrong answer please delete and write the right answer clearly
- This paper consist of three parts
- PART A: (10 multiple choices) = 10 marks
- PART B: (10 structured questions) = 80 marks
- PART C: (Choose 2 questions) = 10 marks
- Total = 100 marks



PART A: MULTIPLE CHOICE (10 MARKS)

Circle the correct answer. If you change your mind please cross out the wrong answer and circle the correct answer clearly (each question carries 1 mark)

- 1) The next term in this sequence 3, 6, 12, 24, is
 - a) 52
 - b) 62
 - c) 72
 - d) 48

- 2) If $A = \{\text{even numbers less than 20}\}$ and $B = \{\text{square numbers less than 20}\}$ then $A \cap B$ is
 - a) {9, 16}
 - b) {2, 16}
 - c) {4, 16}
 - d) {4, 9}

- 3) $(125)^{1/3}$ is equal to
 - a) 5
 - b) 25
 - c) 15
 - d) 50

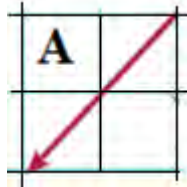
- 4) The probability that it will rain on independent day is 0.25. The probability that it will not rain on independent day is
 - a) 0.5
 - b) 0.25
 - c) 0.55
 - d) 0.75

- 5) Zahra Scored 210 marks out of 250. The percentage she got is
 - a) 84%
 - b) 74%
 - c) 64%
 - d) 94%



6) The column vector to describe the vector **A** is

- a) $\begin{pmatrix} -2 \\ 2 \end{pmatrix}$
- b) $\begin{pmatrix} -2 \\ -2 \end{pmatrix}$
- c) $\begin{pmatrix} 2 \\ 2 \end{pmatrix}$
- d) $\begin{pmatrix} 2 \\ -2 \end{pmatrix}$

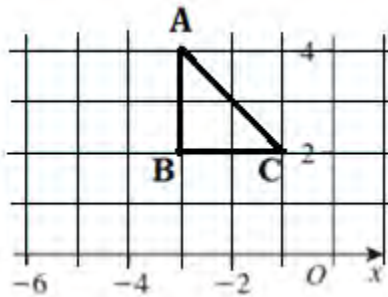


7) When the function is at stationary $\frac{dy}{dx}$ is

- a) negative
- b) positive
- c) zero
- d) One

8) In the figure ABC is translated 5 units left. The new coordinates of the image of point C is

- a) (4, -6)
- b) (-6, 2)
- c) (2, -4)
- d) (-2, -6)



9) Which of the following equations is parallel to the line $y: 6x + 2y - 12 = 0$

- a) $y = 3x - 9$
- b) $y = -2x - 3$
- c) $y = -x + 6$
- d) $y = -3x + 12$

10) The product of these complex numbers $(2 - 5i)(2 + 5i)$ is equal to

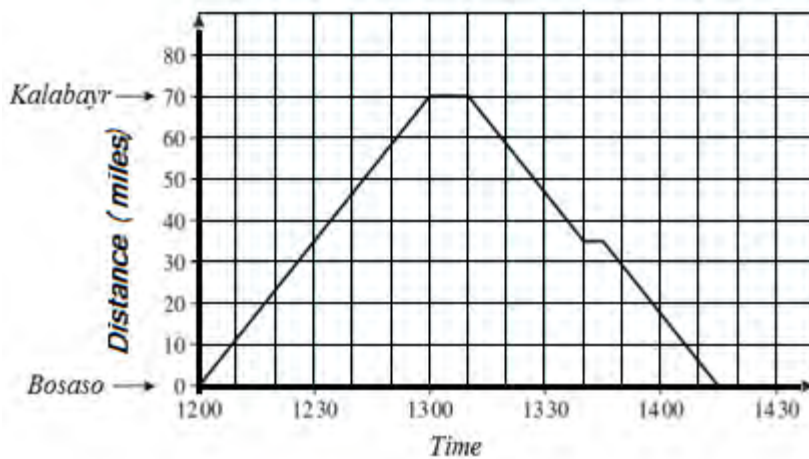
- a) $4 - 25i$
- b) 29
- c) $4 + 25i$
- d) 21

PART B:- STRUCTURE QUESTIONS (TOTAL 80 MARKS)

Answer All questions

Question 1

The diagram shows a distance–time graph for a Truck travelling between Bosaso and Kalabayr



The Truck leaves Bosaso at 12:00 for its outward journey to Kalabayr

a) Work out the speed of the Truck on its journey from Bosaso to Kalabayr (2 marks)

b) How long did the truck stop at Kalabayr Min (1 mrk)

c) State one difference between the outward journey and the return journey.

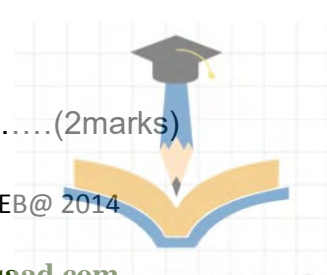
..... (2marks)

d) State one thing that is the same on the outward journey and the return journey.

.....(2marks)

e) Find the total time of whole journey

.....(2marks)



Question 2

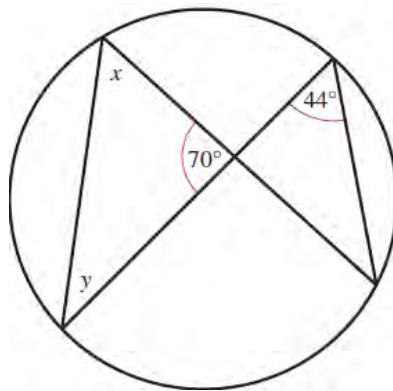
If $f(x) = 2x + 5$ and $g(x) = x^2$ find

a) $fg(3)$ (3marks)

b) inverse of $f(x)$, $f^{-1}(x)$ (3 marks)

Question 3

a) Find the values of the angles marked x and y . Explain your reasoning in both cases.

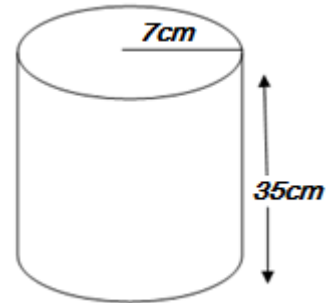


i) $\angle x =$ (2marks)

ii) $\angle y =$ (3marks)



- b) Find the surface area of the open cylinder below (height = 35cm, radius = 7cm)
(4 marks)

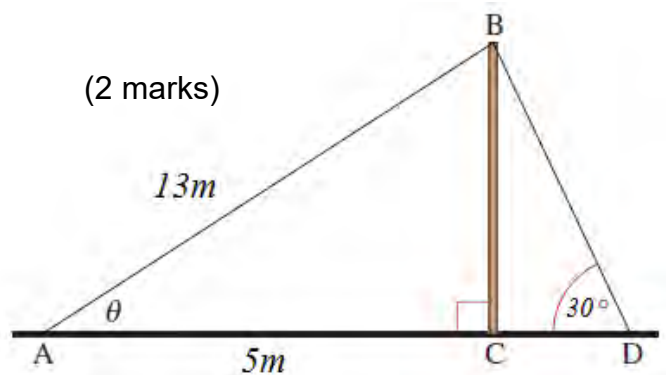


Question 4

The diagram shows a flagpole CB. It is supported by a wire, AB, 13 meters long. A is 5 meters from the base C of the flagpole. The flagpole is supported by a second wire, BD, which makes an angle of 30° with the horizontal ground.

- a) Calculate the height BC of the flagpole.

(2 marks)



- b) Calculate the length BD.

(3 marks)



Question 5

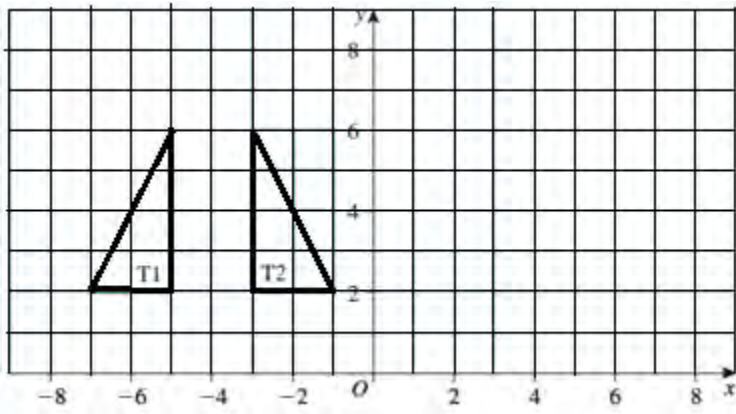
- a) A lady started working on a job which paid a salary of \$ 8000 per year. She received an increment of \$400 every year. Find the salary she received in the 5th year. (4 marks)

- b) Rationalize $\frac{5}{3-\sqrt{2}}$ (3 marks)

- c) Simplify $\frac{8!}{2!3!5!}$ (2marks)



Question 6



- a) Triangle T2 is formed after reflection of triangle T1 in the line $x = \dots\dots\dots$ (1 mark)
- b) Reflect T2 in the line $x = 1$, and label the result T3. (2 marks)
- c) What single transformation maps T1 directly to T3? (3 marks)

.....

Question 7

The following are marks of 11 students in a math’s test 55, 49, 56, 72, 89, 39, 73, 54,92, 90, 85.

Find:-

- a) Lower quartile (2marks)
- b) Upper quartile (2marks)
- c) Inter quartile range (1mrk)
- d) Quartile deviation (2marks)
- e) Median (2marks)



Question 8

Given that vector $\vec{a} = \begin{pmatrix} 5 \\ -7 \end{pmatrix}$ and $\vec{b} = \begin{pmatrix} 0 \\ -5 \end{pmatrix}$

a) Find $\vec{a} - 2\vec{b} =$ (3 marks)

b) Find the length (magnitude) of $|\vec{b}|$ (3 marks)

c) A rectangle has a length of $(2 - x)$ cm and a width of $(3 + x)$ cm.

i) Find the perimeter of the rectangle in terms of x . (2 marks)

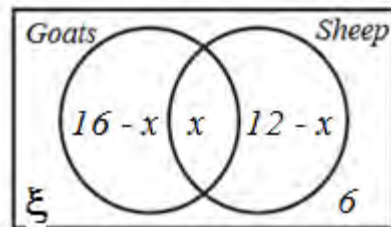
ii) Find the area of the rectangle in terms of x . (3 marks)

d) Solve this equation $\frac{5x-1}{3} = \frac{x+4}{2}$

(3 marks)

Question 9

Let $\xi = \{\text{families in survey}\}$, $C = \{\text{Sheep owners}\}$, $B = \{\text{Goats owners}\}$. Let the number who said they owned both be x . Then the Venn diagram shows the information. If the number of families is 30. Find



- a) The number of families who own both sheep and goats (3marks)
- b) The number of families who own only sheep. (2 marks)
- c) The number of families who own only goats. (2 marks)

Question 10

a) Calculate $\int_0^3 (4x^3 - 3x^2 + 1)dx$ (3 marks)

b) Find $\lim_{x \rightarrow 3} \sqrt{x^3 - 2x + 1} =$ (2marks)

c) Express as a single logarithm $\log_2 5 + \log_2 6 - \log_2 10$ (2 marks)

PART C: Answer ONLY TWO questions. (10marks) (Each question 5 marks)**Question 1**

The velocity v metres per second of a particle at time t seconds is given by the equation

$$v = 3t^2 - 12t + 10$$

a) Find the acceleration of the particle after 3 seconds (2 marks)

b) Find The distance covered by the object between $t = 0$ sec and $t = 2$ sec (3 marks)

Question 2

A circle has equation of $x^2 + y^2 = 45$

(2 marks)

a) Determine the radius of the circle

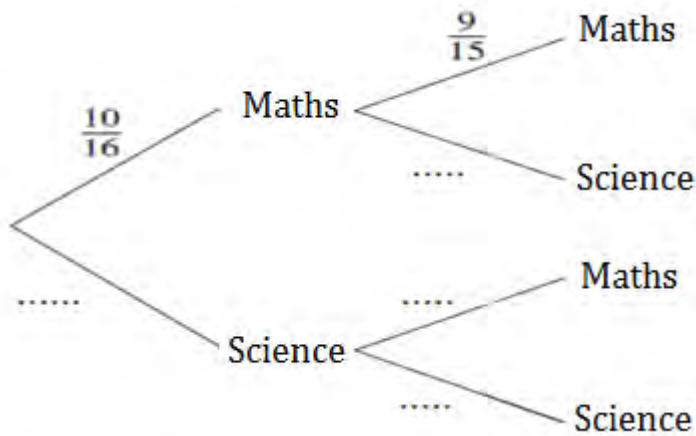


b) Find intersection points of the circle $x^2 + y^2 = 45$ and the line $y = 2x$ (3 marks)

Question 3

My bookcase contains ten math's and six science books. I choose two books at random.

a) Complete the tree diagram (2marks)



b) Find the probability that they are both the same type of book. (3 marks)



Question 4

A curve has equation $y = 2x^3 + 3x^2 - 36x + 1$

a) Find the gradient of the curve when $x = 0$

(1mrk)

b) Find the maximum and minimum coordinates of the curve $y = 2x^3 + 3x^2 - 36x + 1$

(4marks)



Question 5

The table shows some values for the function $y = x^3 - 4x$

X	-3	-2	-2	0	1	2	3
y	-15				-3		15

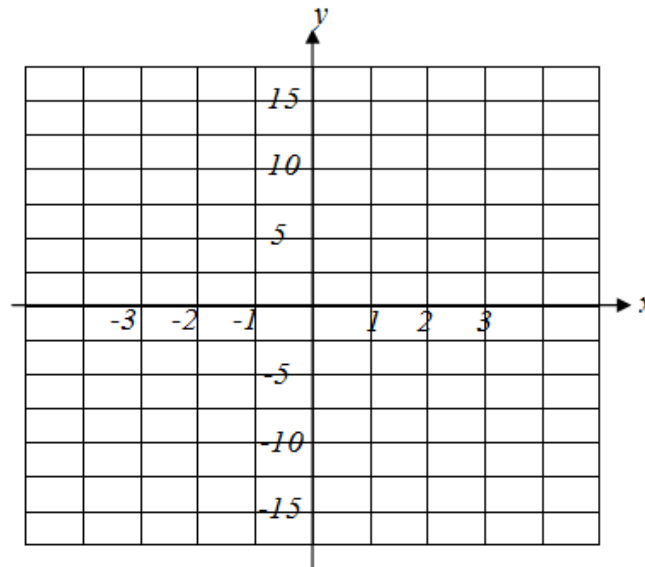
a) Complete the table.

(2 marks)

b) Plot the points in the table, and join them with a smooth curve to draw the graph of

$$y = x^3 - 4x.$$

(3 marks)



END

