MINISTRY OF EDUCATION AND HIGHER EDUCATION

GRADE 12 EXAMS, 2009

MATHEMATICS

2009

P/LAND NATIONAL EXAMINATION BOARD

SomExams

Name.....

School .....

Roll Number.....

Puntland State of Somalia

Ministry of Education

Puntland National Examination Board

Form 4

MATHEMATICS Examination

June 2009

Time 2 hours

Plus 10 minutes before the exam for reading through the paper

TOTAL TIME 2 hours 10 minutes

INSTRUCTIONS TO CANDIDATES

This paper consists of 16 printed pages.
Count them now. Inform the invigilator if there are any missing.

PART ONE (10 Multiple choice questions): 10 marks
PART TWO (9 Structured questions): 90 marks

TOTAL 100 marks

- Answer ALL questions.
- All answers and working must be written on this paper in the spaces provided immediately after each question.
- Rough work can be done on page 2. This will not be marked
- No extra paper is allowed.
- No calculators are allowed.
- If you make a mistake cross out the incorrect answer clearly and write your correct answer.

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

PART 1: Multiple Choice questions. Circle the correct answer. 1 mark each.

1. (a + b)(c + d) is the same as

   A. a + b(c + d)

   B. ac + bd

   C. (a + b)c + d

   D. (a + b)c + (a + b)d

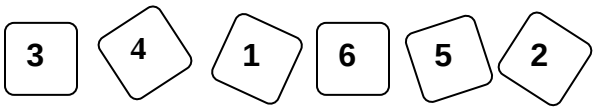
2. Which of the following fractions is equivalent to **0.2 X 0.6**?

   A. $\frac{3}{25}$ *B* $\frac{12}{25}$ *C* $\frac{3}{5}$ *D* $\frac{6}{5}$

3. $2^4 \cdot 3^4$ is the same as

   A. 5^4. B. 5^8. C. 6^4. D. 6^8.

4. Abdi has the following cards with numbers written on them.



   What is the probability of picking a card with an odd number?

   A. $\frac{1}{6}$ B. $\frac{1}{2}$ C. $\frac{5}{6}$ D $\frac{1}{3}$

5. ${}^9C_3$ is equal to

   A) 504 B) 84 C) 18 D) 9 **!**

6. If $f(x) \rightarrow \frac{2x-7}{3}$ then f(2) is

   A) 1 B) 4 C) -3 D) -1

7. What is the gradient of the line 3x-2y = 6.

A) $\frac{2}{3}$ B) $\frac{-2}{3}$ C) $\frac{3}{2}$ D) $\frac{-3}{2}$

8. The tenth term of the sequence 3, 10, 17, 24,…… … is

A) 66 B) 33 C) 73 D) 96

9. The determinant of the matrix $\begin{pmatrix} -2 & 4 \\ 8 & -4 \end{pmatrix}$ is

A) 40 B) 24 C) -24 D) - 40

10. The least common multiple (L.CM) of 18, 40, and 75 is

A) 240 B) 1800 C) 300 D) 5400

ANSWER ALL QUESTIONS. 90 MARKS

QUESTION 1

Solve the following

a) 3x-4=11 (1 mark)

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b) 5x +17=3(x+6) (2 marks)

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c) Find the value of

i) 2^5 ……

…… (1 mark)

ii) 3^0…… ……..

…… (1 mark)

d) Look at these numbers. 45, 47, 49, 51, 53, 55, 57,59. Write down the ones that are prime

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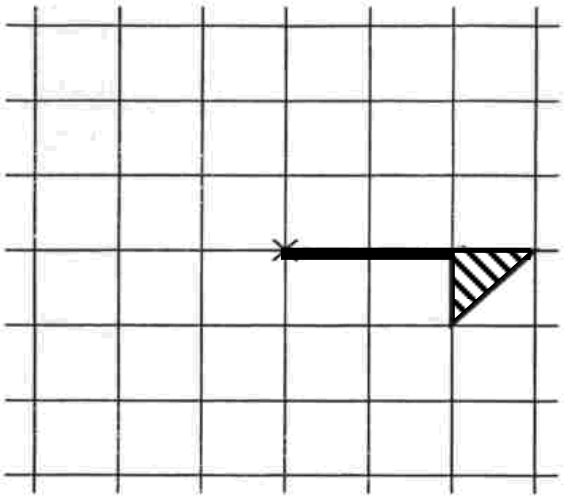
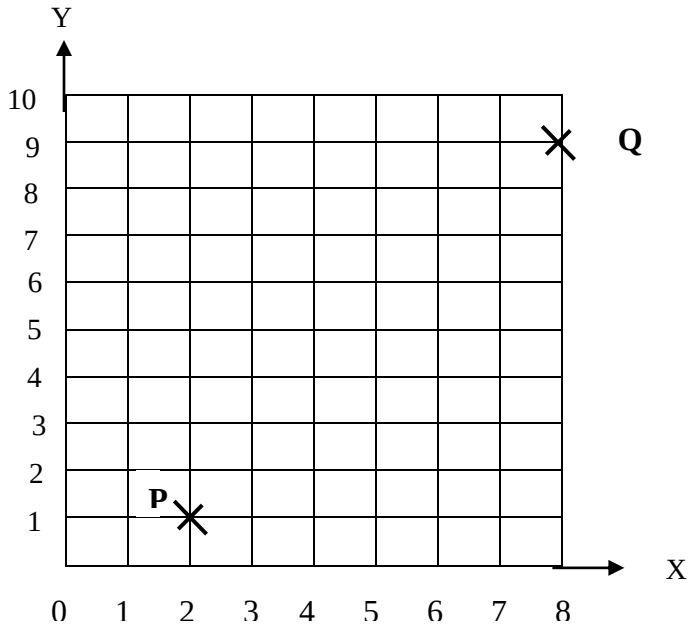
……(2 marks)

e) The grid has a flag drawn on it. Draw accurately the position of the flag after it has been rotated through a $\frac{1}{4}$ (90^0)-turn clockwise about the cross (x) on the grid. (2 marks)



QUESTION 2



a) Work out the gradient of the line joining P to Q. (2 marks)

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b) Calculate the length PQ (2 marks)

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c) Find the coordinates of the mid-point of PQ (2 marks)

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d) P is fixed but Q moves so that PQ remains a constant length. Describe fully the locus of Q

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…… (3 marks)

QUESTION 3

Three people Saed, Ahmed and Daud invested $90 000, $ 75 000, and $ 60 000 respectively in a business in Bosaso. They agreed to share any profit in the ratio of their investments.

a) Write this ratio in the form a:b:c as simply as possible.

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……(3 marks)

b) In 2008 they made $ 18 750 profit. How much did Saed receive?

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……(3 marks)

c) How much more did Ahmed get than Daud?

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…… (3 marks)

QUESTION 4

For the frequency distribution shown below, find the

Shoe size	5	5 ½	6	6 ½	7
Frequency	3	4	10	14	4

a) median (2 marks)

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…… ……

b) mode (2 marks)

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c) mean (4 marks)

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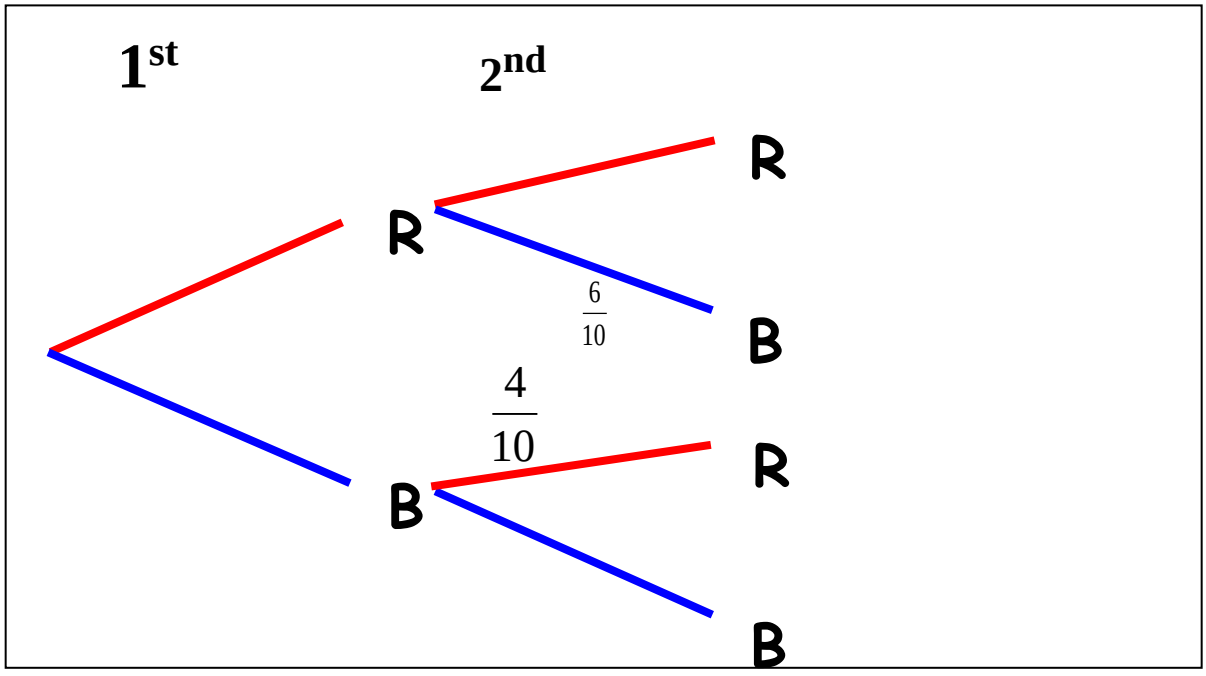
QUESTION FIVE

a) There are 4 red and 6 blue pens in a drawer. Two are taken out at random. Complete the tree diagram showing the probabilities of the different events if the 1st is replaced before the 2nd is taken. (4 marks)



b) Find the probability of drawing out

i) one red and one blue pen (3 marks)

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ii) two blue pens (3 marks)

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QUESTION SIX

a) Evaluate $\int_3^4 (3x^2 - 2x + 6)dx$ (4 marks)

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b) The distance, S metres traveled by an object moving in a straight line from a fixed point after t minutes is given by $s = t^3 - 5t^2 + 3t + 1.$ Find the

i) velocity when t=1 (4 marks)

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ii) acceleration when t=3. (4 marks)

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QUESTION SEVEN

a) Prove the identity $1 + \tan^2\theta \equiv \frac{1}{1 - \sin^2\theta}$ (4 marks)

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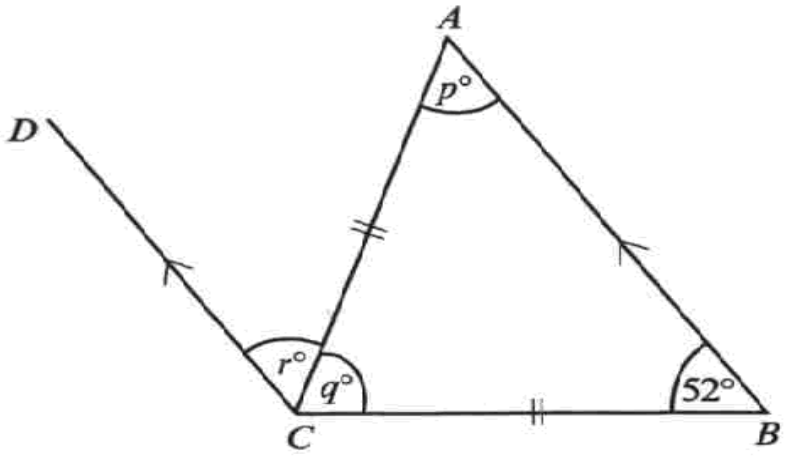
b)



AB = BC. AB is parallel to DC. Angle ABC =52^0. Work out the value of

i) p (2 marks)

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…… ……

ii) q (2 marks)

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c) The angles marked p and r are equal. What geometrical name is given to this type of equal angles?

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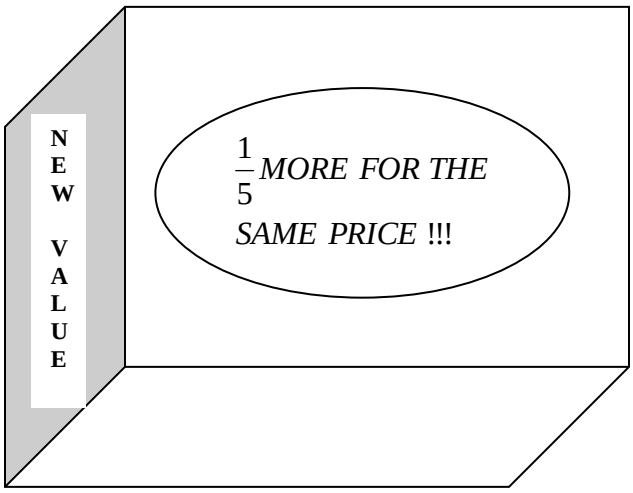
…… (2 mark)

QUESTION EIGHT

a)



Boxes of Bosaso biscuits used to contain 650 grams of biscuits. New boxes contain one fifth more. How much does a new box contain?

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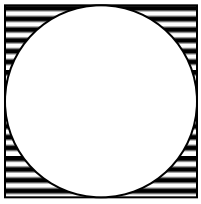
……(2 marks)

b) Calculate the shaded area of the given figure. Take $\pi = \frac{22}{7}$



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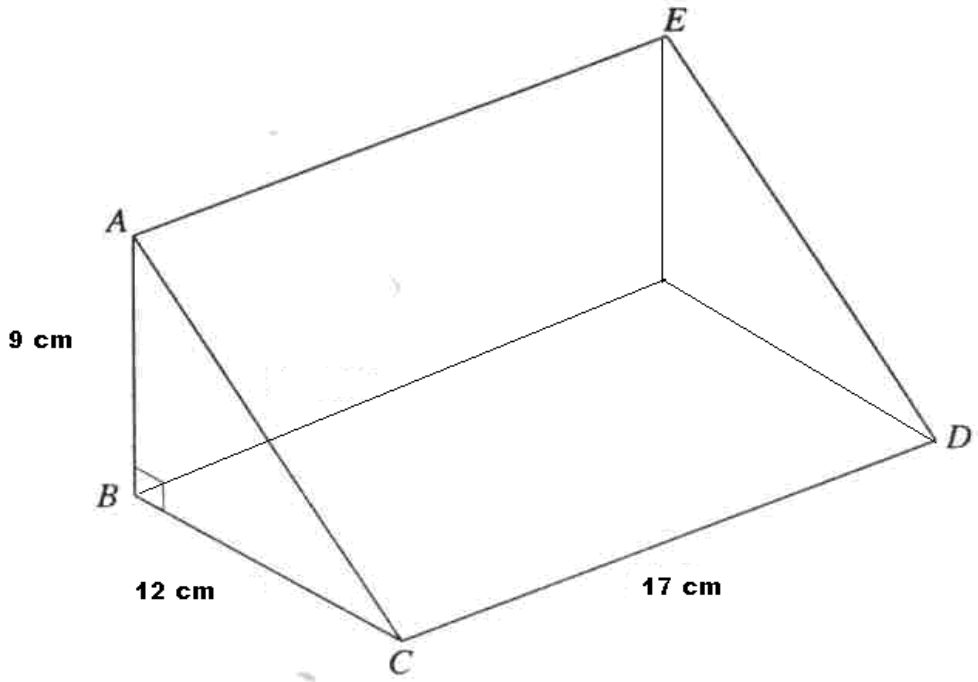
…… (3 marks)

c)



For the given triangular prism, calculate

i) its total surface area

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…… (4 marks)

ii) its volume

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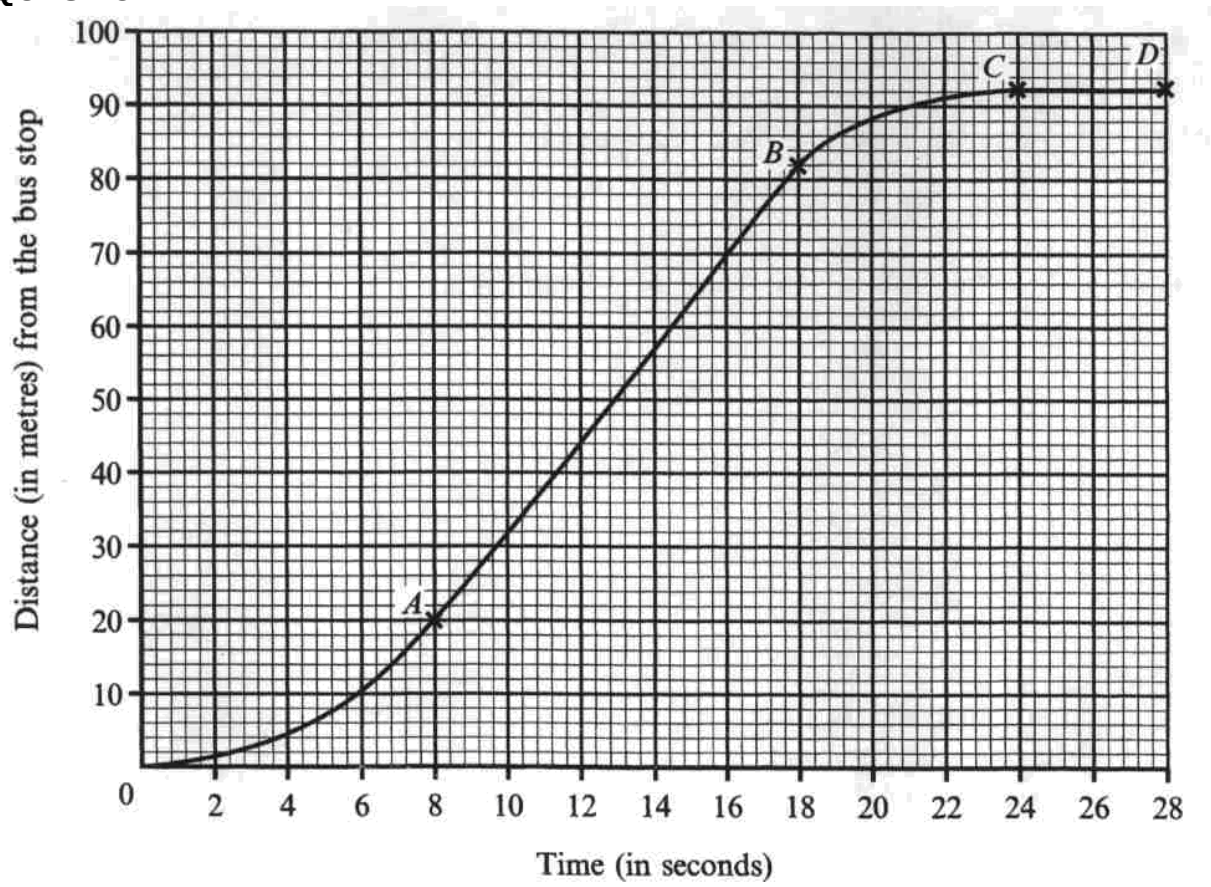
QUESTION NINE



The diagram shows part of a distance / time graph for a bus after it had left a bus stop at Burtinle.

a) Use the graph to find the distance the bus travelled in the first 20 seconds after it had left the bus stop.

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……(2 mark)

b) Describe the journey of the bus represented by the parts AB, BC, and CD of the graph.

AB

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……(2 marks)

BC

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…… (2 marks)

CD

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c) Using the graph, work out an estimate of the speed of the bus 6 seconds after it had left the bus stop.

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…… ….(3 marks)

END