Province of the
EASTERN CAPE
EDUCATION

SENIOR PHASE

GRADE 9

NOVEMBER 2012

MATHEMATICS

MARKS: 100

TIME: 2 hours

This question paper consists of 16 pages.

INSTRUCTIONS AND INFORMATION

1. Answer all the questions.

2. Write neatly and legibly.

3. Do not change the numbering of the questions.

4. Show all your calculations, correct your answer to TWO decimal places where necessary.

5. A non-programmable calculator may be used.

QUESTION 1

There are TEN multiple-choice questions in QUESTION 1. For each question FOUR possible answers are given and only one answer is correct. Write the number then select the letter for the correct answer and write it next to the corresponding question number. Do not rewrite the question.

EXAMPLE :

e.g.   1.11   If 3 loaves of bread are equally divided among 6 people, each will get:

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

The correct answer is $\frac{1}{2}$ which is letter A.

Answer: 1.11 A

1.1   Which of the following is not a property of rational numbers?

   A   Terminating decimals
   B   Recurring decimals
   C   Square root of a perfect square
   D   Cube root of a prime number   (1)

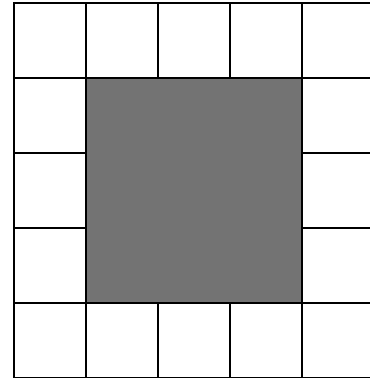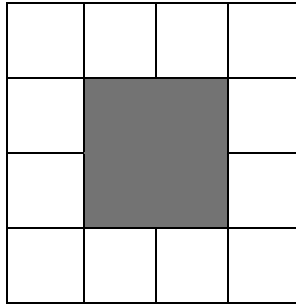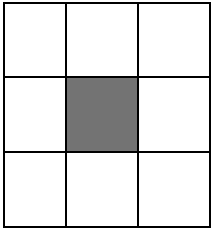1.2 $(2^2)^3 \times (2^2)^{-3}$ Simplified is:

   A 2^{10}
   B 2^{-1}
   C   2
   D   1   (1)

1.3   An output that is given by the 28th term in the sequence 5; 9; 13; 17; … is.

   A   112
   B   113
   C   116
   D   117   (1)

1.4 $a = 4$; $b = 6$ and $c = 5$ then the value of $2a + bc$ =

   A   77
   B   70
   C   54
   D   38   (1)

1.5   A pattern used to find the number of tiles used to surround square flower beds:

A   4(n + 1)
B   2(2n + 1)
C $n^2 + 1$
D   n + 1   (1)
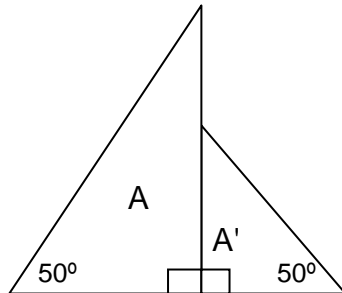
1.6   A 3D figure which has 18 edges, 8 faces and 12 vertices is a …

A   decagonal prism.
B   pentagonal prism.
C   hexagonal prism
D   square based pyramid.   (1)
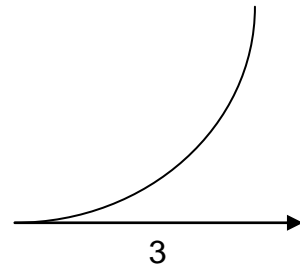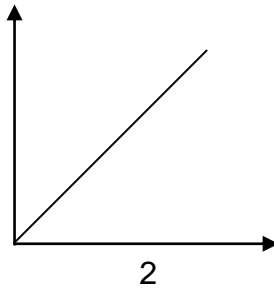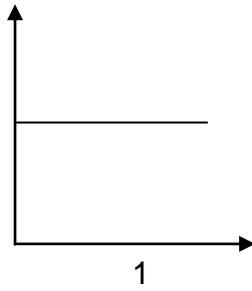
1.7   Triangle A is transformed to triangle A'. This type of transformation is a …

A   translation – reduction.
B   rotation – reduction.
C   reflection – reduction.
D   reflection – rotation   (1)
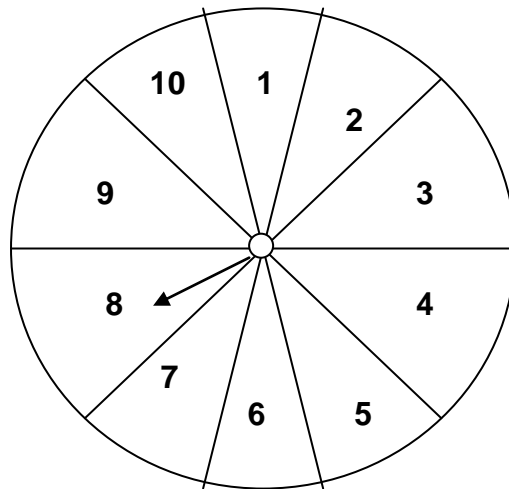
1.8   Select the graph(s) that best represent(s) the height of water in a regular
        cylinder bucket being filled from a tap with constant flow of water.

        1   2   3

        A   1 and 2
        B   3 only
        C   1 and 3
        D   2 only   (1)

1.9   The spinner below is rotated. The probability that the arrow will point to a prime
        number is:

        A $\dfrac{1}{4}$

        B $\dfrac{3}{5}$
        C $\dfrac{2}{5}$

        D $\dfrac{1}{2}$ (1)

1.10 The correct tally table for the following data

1; 2; 3; 1; 2; 3; 4; 1; 3; 2; 2; 1; 1 is:

Number	Tally
1	LHI
2	///
3	///
4	//
5	//

A

Number	Tally
1	/
2	//
3	///
4	////
5	LHI

B

Number	Tally
1	LHI
2	////
3	///
4	/
5	-

C

Number	Tally
1	////
2	LHI
3	///
4	//
5	/

D

[10]

QUESTION 2

2.1 Angela spent $\frac{2}{5}$ of her money for entertainment. If she now has R30 left, how much did she have at first? (2)

2.2 2.2.1 What would be the height of a stack of 200 000 sheets of paper of the same size, if the thickness of ONE sheet of paper is 0,08928 mm? (1)

2.2.2 Write your answer of QUESTION 2.2.1 in scientific notation. (1)

2.3 Andiswa bought a R1 500 hi-fi sound system on hire purchase. The deposit was R150 and the balance is payable monthly over 3 years at 18% p.a. simple interest.


Encarta Encyclopedia, Thomson Consumer Electronics, Inc.

2.3.1 Calculate the total amount she would pay for the hi-fi. (4)

2.3.2 Determine the monthly installment Andiswa will pay if the insurance premium of R10,50 is added monthly. (1)

[9]

QUESTION 3

Mr Nkuti, a young man is staying on the fifth floor of a multistory building. He prefers to use steps as a form of exercise rather than using a lift. The steps of the building are constructed as shown in the structures below.

Structure 1   Structure 2   Structure 3   Structure 4
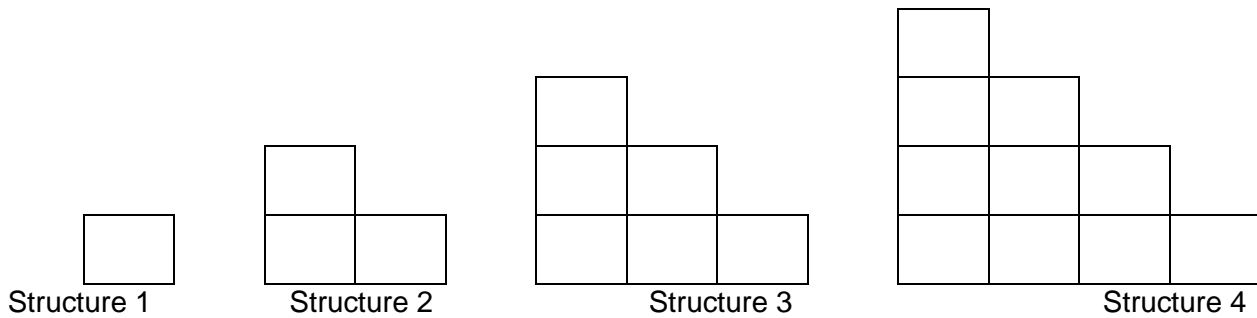
3.1   Draw the next structure. (1)

3.2   The table below shows the relationship between the structure number and the number of blocks.
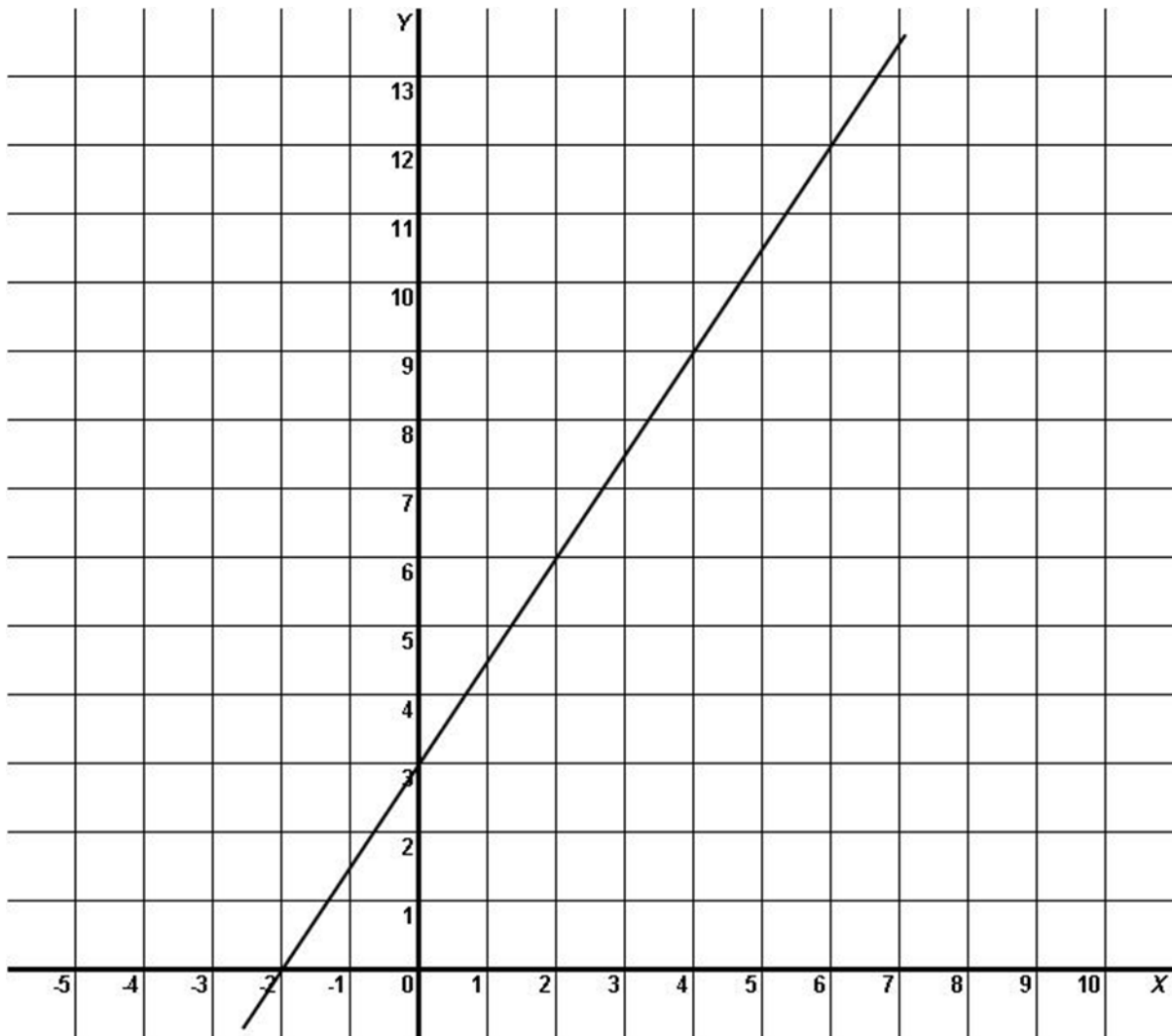
Structure number (n)	1	2	3	4	…..	6	n
Number of blocks (b)	1	3	6	10	…..		

3.2.1   Write the general rule for any structure (i.e. n^{th} structure). (2)

3.2.2   How many blocks can be used to form structure 6? (1)

3.3   Design a flow diagram using $y = 3x - 5$ where x lies between 0 and 5. (3)

3.4   Read the graph below and then answer the questions that follow.

3.4.1   Determine the equation of the graph above.   (2)

3.4.2   Use the equation obtained in QUESTION 3.4.1 to find the value of y when $x = 3$ (1)

3.5   The admission policy of Jenge Junior Secondary School states that the current year's admission must be twice the previous year's admission. In the fourth year the total number of learners is 1 500. How many learners were admitted in the first year (i.e. four years ago)?   (4)

[14]

QUESTION 4

4.1   Factorise: $9p^2q - 81p^2q^3$

4.2   Simplify:

4.2.1 $(3x - 2)(5x + 1)$ (2)

4.2.2 $\dfrac{12x^2y^3z^4}{8x^3y^2z^2}$ x $\dfrac{8x^2y^3}{16xy}$ (4)
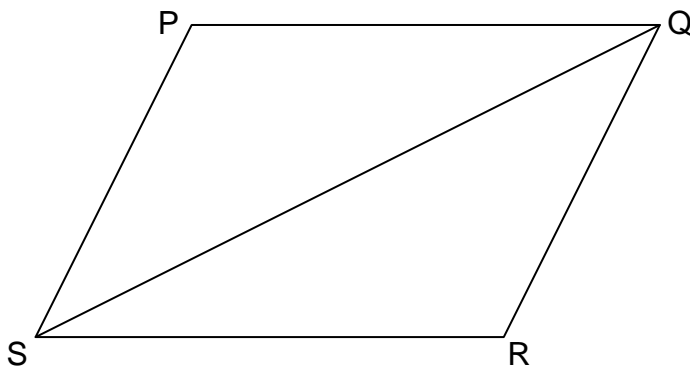
4.3   Solve for x in the equations below.

4.3.1 $\dfrac{x-6}{2} + \dfrac{3(x+8)}{4} = x+3$ (4)

4.3.2 $2^{2x} = 64$ (3)

                                                                                    [17]

QUESTION 5

5.1   The sum of the angles of any polygon is 180⁰ (n – 2) where n stands for the
      number of sides. If the sum of the angles of a regular polygon is 1 260⁰, calculate
      the number of sides.   (2)

5.2   In the figure below, PQRS is a parallelogram with diagonal QS.

      Prove that $\Delta\, SPQ \; \equiv \; \Delta\, QRS.$ (4)

5.3   The sides of a triangle are 6 cm, 7 cm and 10 cm. Find the length of the longest
   side of a similar triangle whose shortest side is 12 cm.   (2)

5.4   On the set of axes given below consider quadrilateral LMNO with its coordinates and then answer the questions that follow.
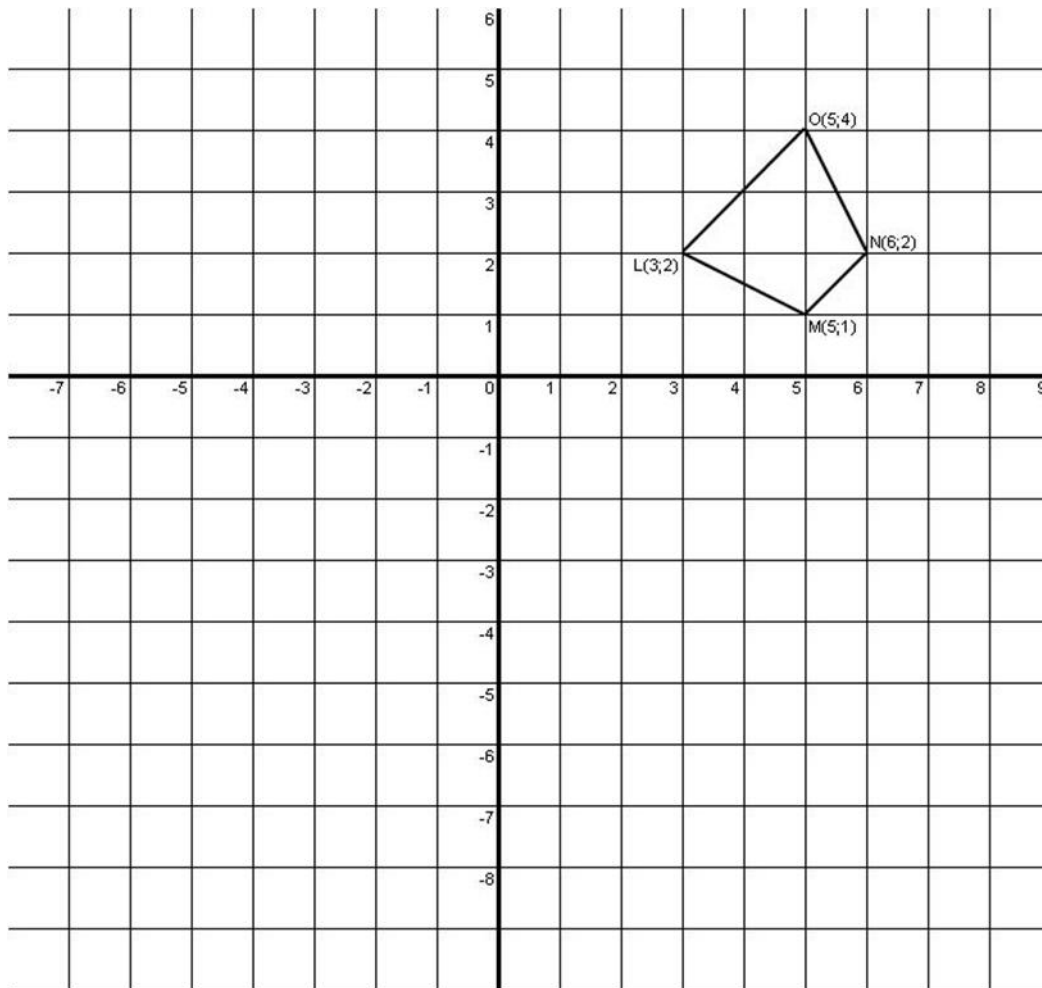
5.4.1   Determine the coordinates of the image under the transformation rule
$(x) \rightarrow (x; y - 7)$ (2)

5.4.2   Use ANNEXURE 1 to draw an image of the quadrilateral LMNO under the transformation rule in QUESTION 5.4.1.   (2)

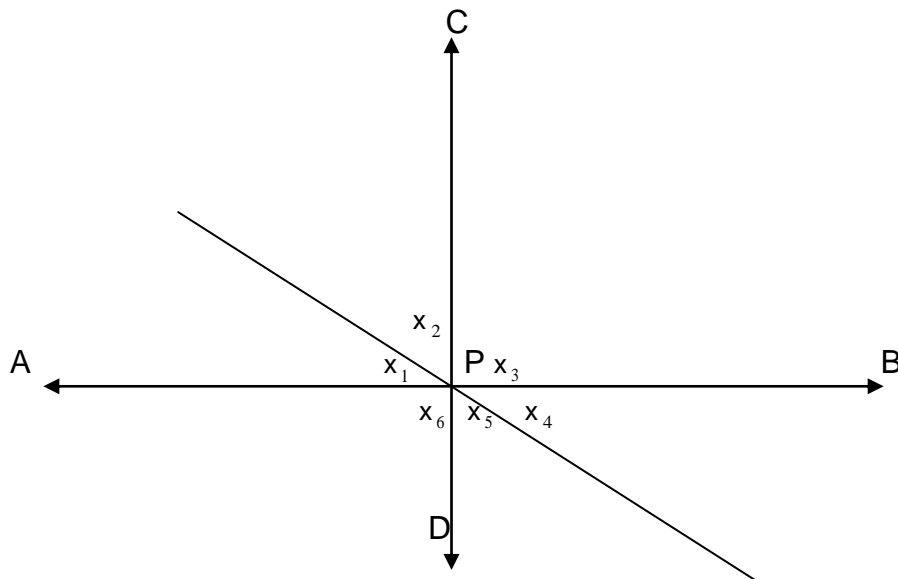5.4.3   On the same ANNEXURE 1, slide the image 4 units to the left.   (2)

[14]

QUESTION 6

6   The figure below has PQ // ST, $P\hat{S}V = 125^{\circ}$ and $Q\hat{T}U = 95^{\circ}$.
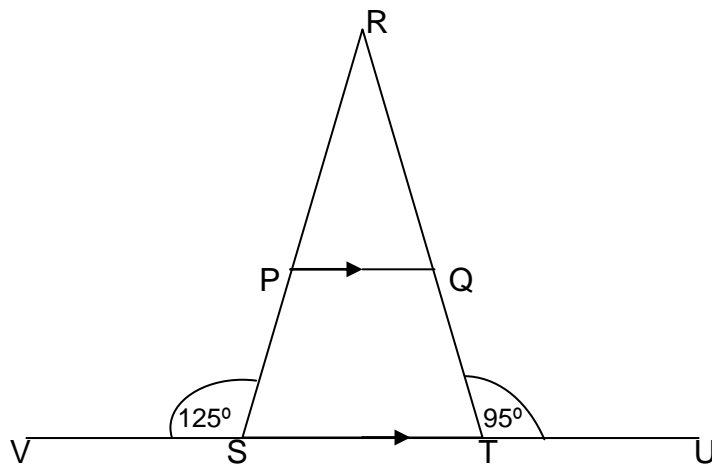
6.1   Calculate with reason(s) the size of $P\hat{Q}R$.   (3)

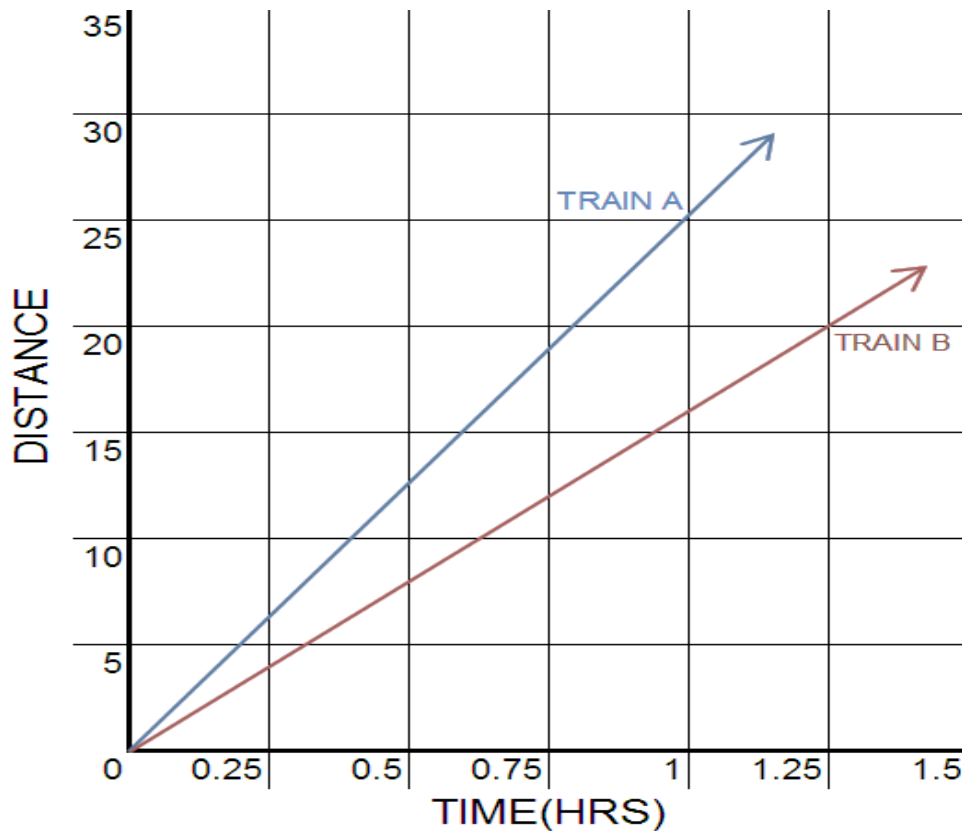6.2   In the sketch below, AB is horizontal and CD is vertical.

6.2.1   Elevation   (1)
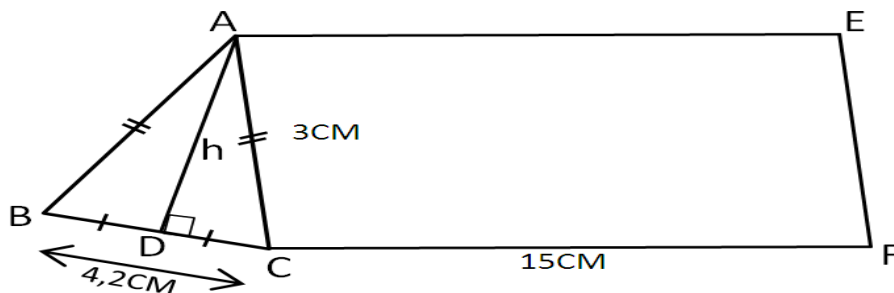
6.2.2   Depression   (1)

                                                                              [5]

QUESTION 7

7.1   Study the graphs below and then answer the questions that follow.

7.1.1   Work out the speed of train B (Hint: if speed = $\frac{distance}{time}$)   (1)

7.1.2   Which of the two trains is faster? Motivate your answer.   (2)

7.2   The figure below represents a triangular prism.

7.2.1   Determine the height (h) of the base of the prism.   (2)

7.2.2   Calculate the total surface area of the prism.   (4)

[9]

QUESTION 8

8.1 The table below shows the class interval of the exam marks of 120 learners in Grade 9.

Marks	0 – 9	10 – 19	20 – 29	30 – 39	40 – 49	50 – 59	60 – 69	70 – 79	80 – 89	90 – 100
No. of Learners	3	5	2	9	18	28	30	12	11	2

   If the pass mark is 40%, how many learners failed the exam? (1)

8.2 Talita wrote 8 Mathematics tests in 2012. For her to get Level 7 in the CASS mark for the subject, she must get a minimum average of 80 marks for her 8 tests. What is the <u>minimum </u>total mark she must get in order to obtain Level 7? (1)

   [2]

QUESTION 9

9.1 A survey was conducted to test the relationship between the hand length and shoe size. The table below shows 10 measurements of different hand lengths and shoe sizes.

Hand length	5	7	2	9	6	7	4	9	8	5
Shoe size	12	13	10	15	12	15	11	16	15	11

   9.1.1 Use ANNEXURE 2 to draw a scatter graph using the information in the table. (5)

   9.1.2 What conclusion can you draw about the relationship between the hand length and the shoe size? (1)

   9.1.3 Find the median hand length. (2)

   9.1.4 Find the mode of the shoe size. (1)

   9.1.5 Calculate the mean of the shoe size. (2)

   9.1.6 Determine the range of the hand length. (1)

9.2 Any game played has the following three possibilities; win, draw and loss. Ama-Bokoboko played two friendly games. Draw a two-way table to list all possible outcomes. (3)

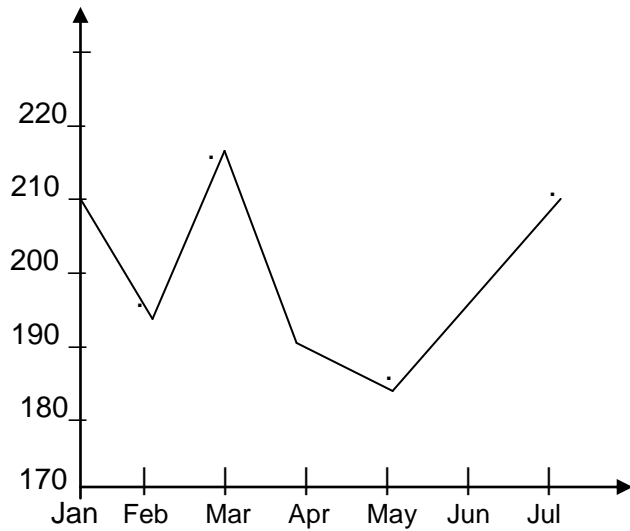9.3 What is the probability of:

   9.3.1 Winning both games? (1)

   9.3.2 Winning 1 game and losing 1 game? (1)
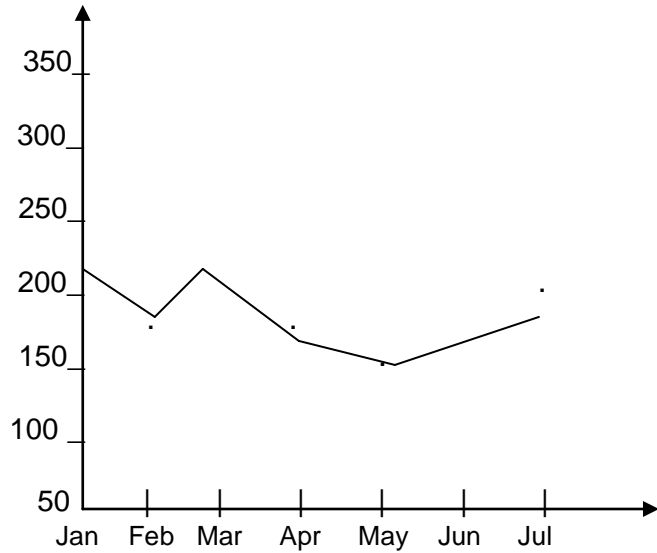
   9.3.3 Winning at least 1 game? (1)

9.4 The two graphs below represent the same information about the share prices in 2009.

Share Prices (R)

Graph 1

Share Prices (R)

Graph 2

9.4.1 Which ONE of the graphs represents the information more clearly? (1)

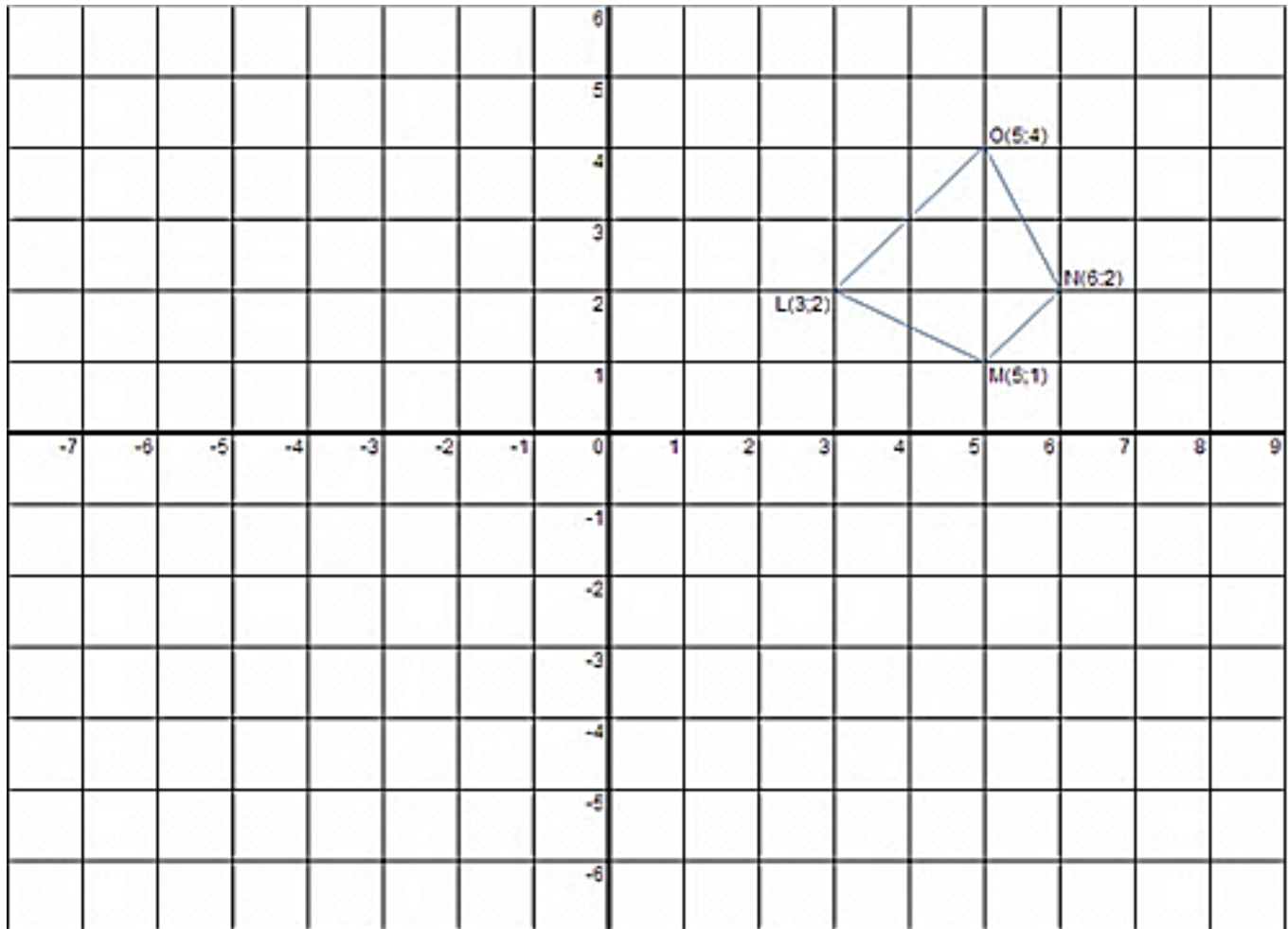9.4.2 Why does Graph 1 look different from Graph 2? (1)

[20]

TOTAL: 100

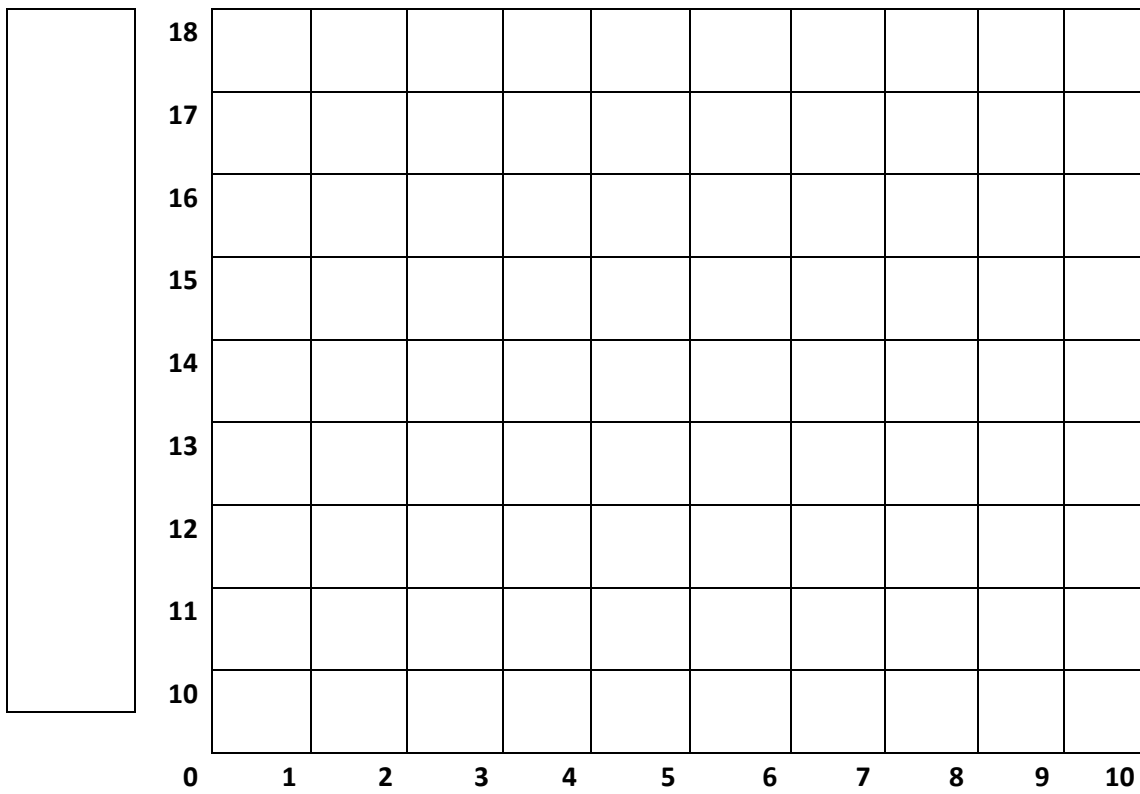**ANNEXURE 1**

SURNAME : _____

NAME : _____

PROVINCE : _____

DATE : _____

QUESTION 5.4.2 and 5.4.3

ANNEXURE 2

SURNAME : _____

NAME : _____

PROVINCE : _____

DATE : _____

QUESTION 9.1.1