



Province of the  
**EASTERN CAPE**  
EDUCATION

**SENIOR PHASE**

**GRADE 9**

**NOVEMBER 2011**

**MATHEMATICS**

**MARKS: 100**

**TIME: 2 hours**

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This question paper consists of 14 pages, including annexures.

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**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

In QUESTION 1, there are multiple choice questions. Four possible answers are given for each question. Only one answer is correct. Select the best answer and use the answer sheet provided in ANNEXURE 1 to make a cross on the corresponding letter for the correct answer.

Example:

1.11  $\sqrt[3]{8}$  is ...

- A 24
- B 2
- C 2,7
- D 512

The correct answer is **2** which is letter **B**.

1.11 

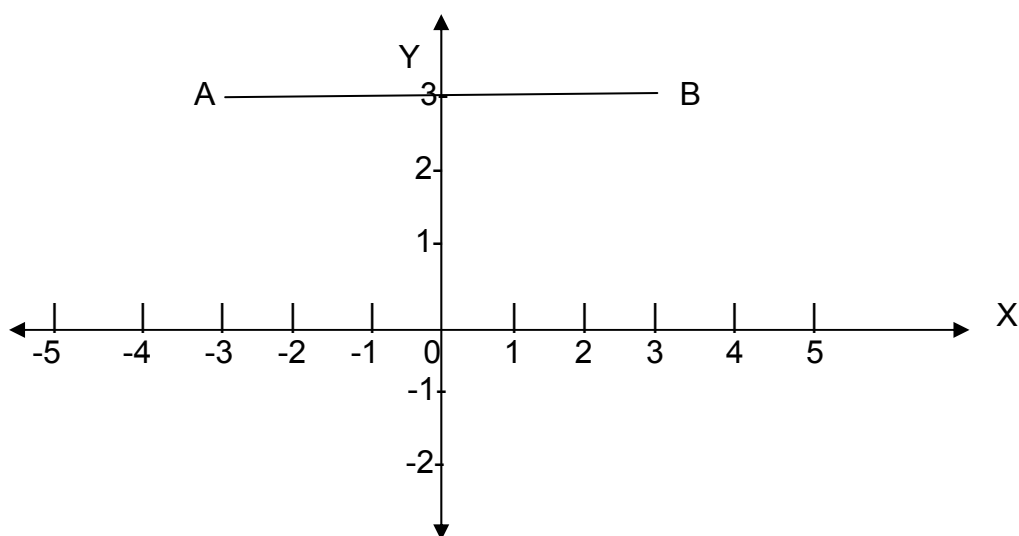
<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
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1.1  $\frac{4.5 \times 640\,000}{15 \times 320} = \dots$

- A  $6 \times 10^2$
- B  $6 \times 10^{-2}$
- C  $0,6 \times 10^2$
- D  $0,6 \times 10^{-2}$

(1)

1.2 The equation for the line graph AB below is:



- A  $x = 3$
- B  $y = 3$
- C  $x = y + 3$
- D  $y = x + 3$

(1)

1.3 The sequence 11; 14; 17; 20; ..., 101 consist of ...

- A 30 terms
- B 31 terms
- C 33 terms
- D 34 terms

(1)

1.4 The expression  $(x + 3)(x - 2) + 2x^2$  is ...

- A  $3x^2 + x - 6$
- B  $3x^2 - x - 6$
- C  $3x^2 + 2x - 6$
- D  $3x^2 + 5x - 6$

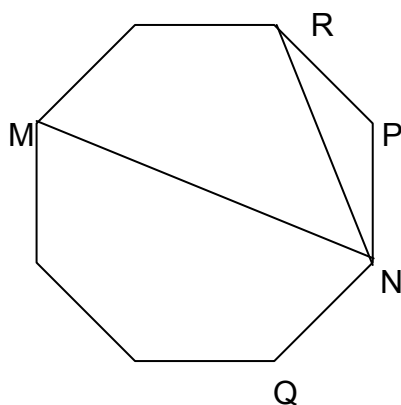
(1)

1.5 Uncle Zondi bought 4 boxes of pencils for his niece. He placed them in a pencil case so that they do not get lost. The pencil case had 7 pencils in it already. The total number of pencils in the case is 27. How many pencils are in each box?

- A 38
- B 35
- C 5
- D 10

(1)

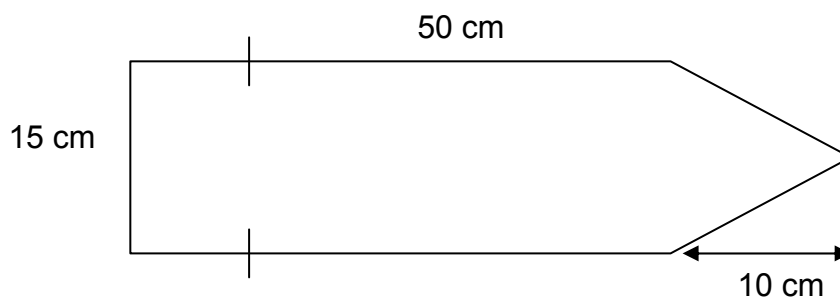
1.6 In the regular octagon below MN bisects  $\angle QNP$ . The size of each angle of a regular octagon is  $135^\circ$ . Therefore  $\angle MNR$  is ...



- A  $60^\circ$
- B  $67,5^\circ$
- C  $45^\circ$
- D  $75^\circ$

(1)

1.7

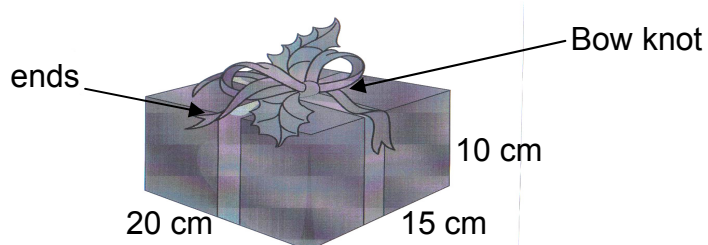


The area of the figure given above is ...

- A 528 cm<sup>2</sup>
- B 150 cm<sup>2</sup>
- C 825 cm<sup>2</sup>
- D 750 cm<sup>2</sup>

(1)

- 1.8 Zelha has prepared her mother's birthday-present tied with a ribbon as shown. The bow knots and ends used 47 cm of ribbon.



The total length of the ribbon used in metres is ...

- A 30,47 m.
- B 0,45 m.
- C 0,92 m.
- D 1,57 m.

(1)

- 1.9 Tommy, Andile and Temba dig a hole in 6 days. If they are assisted by 6 friends, how long will they take, working at the same rate, to dig a hole of the same size?

- A 9 days
- B 2 days
- C 4 days
- D 18 days

(1)

- 1.10 Two coins are tossed. The probability of obtaining the same outcome twice is ...

- A  $\frac{2}{3}$   
 B  $\frac{3}{4}$   
 C  $\frac{1}{4}$   
 D  $\frac{1}{2}$

(1)  
**[10]**

## QUESTION 2

- 2.1 Mr. Ceolo needs R12 000 to renovate his house. The financial institution has agreed to offer him a loan at one of the following rates:

8,8% per annum compound interest, or  
 9% per annum simple interest

- 2.1.1 If Mr. Ceolo wants to pay over 2 years. Show by calculation which offer is a better option. Compound Interest or Simple Interest. (4)

- 2.1.2 How many US dollars should his friend in the USA send him for the renovations? HINT: exchange rate \$ 1 = R 7,12 (1)

- 2.2 Water is being pumped into a tank at a rate of 150 litres per minute. How long will it take to fill a tank with a volume of 81 000 litres?  
 Give your answer in hours. (2)  
**[7]**

## QUESTION 3

- 3.1 Simplify:

3.1.1  $\frac{4x^2y}{xy^3} \div \frac{10xy}{x^2y^3}$  (3)

3.1.2  $4(x - 3x)(3x + 2) + 7x^2 - (1 - 2x^2)$  (4)

- 3.2 Factorise:

3.2.1  $36a^3b^2c + 16a^2b^2 - 4a^2bc$  (2)

3.2.2  $25a^2 - 49b^2$  (2)

- 3.3 Evaluate  $5^2 - 3^2$  using factorisation. (Do not use a calculator.) (2)

3.4 Solve for  $x$ :

3.4.1  $5^x = \frac{1}{125}$  (2)

3.4.2  $\frac{x+3}{4} - \frac{x-2}{8} = \frac{x+4}{16}$  (4)

3.5 Consider the table below and answer the questions that follow:

$x$	1	2	3	4	5	17	B	N
$y$	0	3	8	15	24	A	528	?

3.5.1 What is the general rule for the pattern? (2)

3.5.2 Find the value of A, i.e.  $y$  when  $x = 17$ . (1)

3.5.3 Find the value of B, i.e.  $x$  when  $y = 528$ . (2)

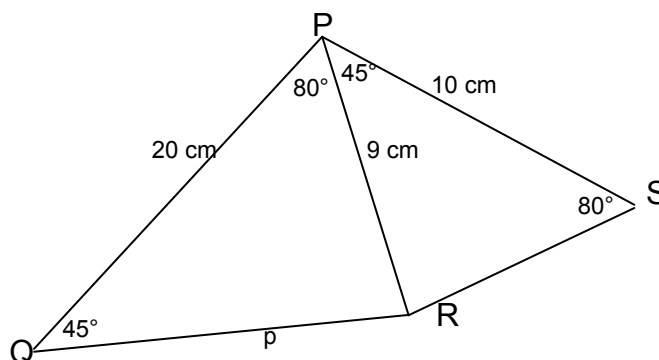
3.6 3.6.1 Use ANNEXURE 2 to draw the graphs of  $2x + 3y = 6$  and  $y = x + 2$  for  $x \in \mathbb{R}$  on the same system of axes. Label the graphs. (6)

3.6.2 Determine the point of intersection of the two graphs. (1)

[31]

#### QUESTION 4

4.1

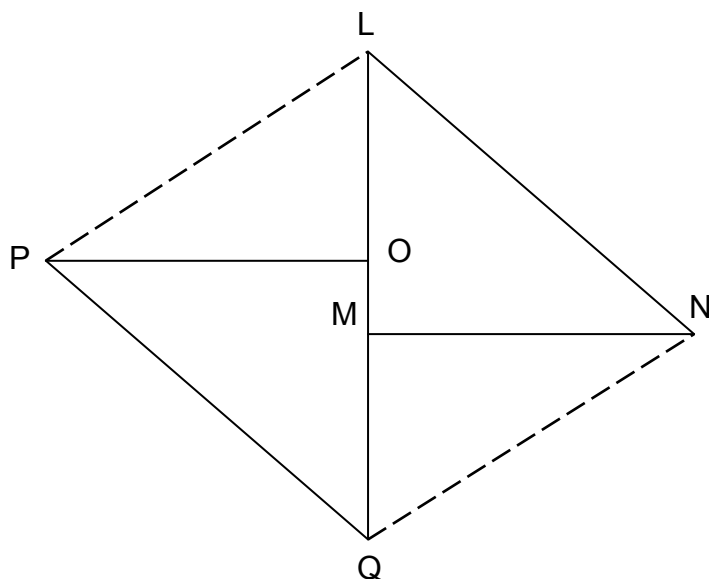


In the above figure;  $\triangle PQR \parallel \triangle SPR$ .

4.1.1 Work out the length of  $p$ . (2)

4.1.2 Using the answer from QUESTION 4.1.1 and give reasons for  $\triangle PQR \parallel \triangle SPR$  (1)

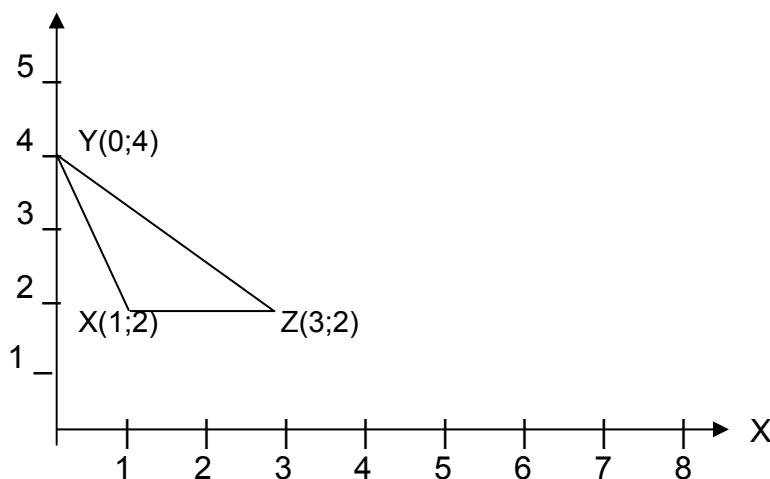
- 4.2 In the diagram below  $LO = MQ = 6$  cm;  $OM = 3$  cm;  $\angle POQ = 30^\circ$ ;  $PQ = LN$ ;  $PO \perp LQ$  and  $MN \perp LQ$ .



4.2.1 Show with reasons that  $LM = QO$ . (2)

4.2.2 Prove that  $\triangle POQ \cong \triangle NML$ . (3)

- 4.3 Shown below is  $\triangle XYZ$  with  $X(1;2)$ ,  $Y(0;4)$  and  $Z(3;2)$ .



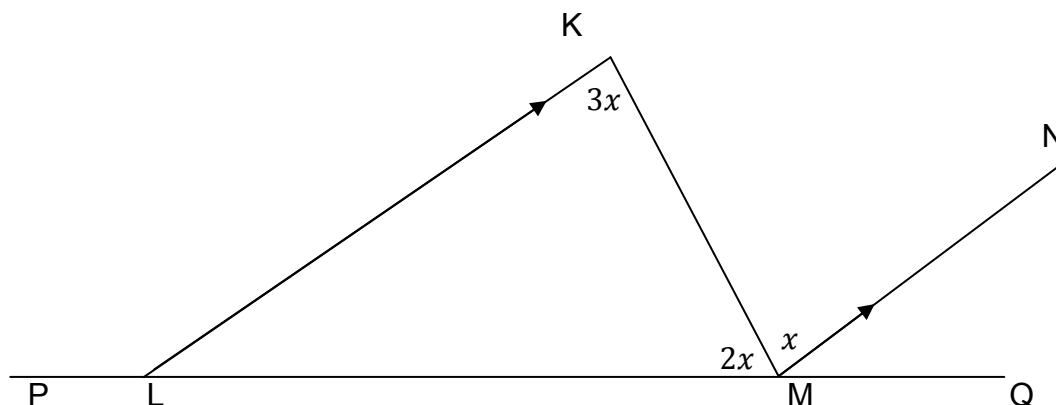
4.3.1 If  $\triangle XYZ$  is enlarged by a factor of 2 (i.e. doubled), draw the image of  $\triangle XYZ$  on ANNEXURE 3. (2)

4.3.2 On the same Cartesian plane in ANNEXURE 3, reflect the image of  $\triangle XYZ$  (the enlarged triangle) in the  $y$ -axis. (2)

4.3.3 Write down the co-ordinates of the reflected triangle. (2)



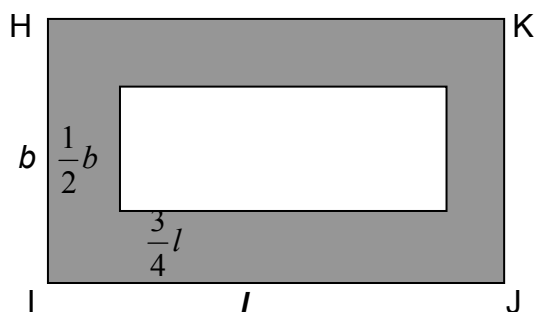
- 4.4 The figure below shows that  $LK \parallel MN$ ;  $\hat{LKM} = 3x$ ;  $\hat{KML} = 2x$  and  $\hat{NMQ} = x$ .



- 4.4.1 Calculate with reasons the value of  $x$ . (3)
- 4.4.2 What is the size of  $\hat{LKM}$ ? (1)
- 4.4.3 Which type of triangle is  $\triangle MKL$ ? (1)

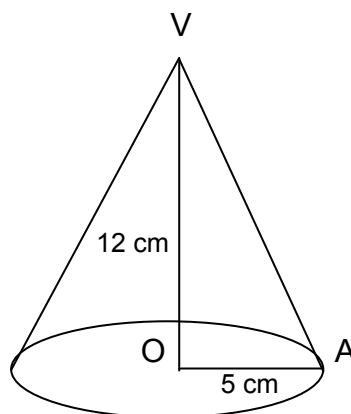
**[19]****QUESTION 5**

- 5.1 The perimeter of the rectangle HIJK is 48 m. The length is equal to one third (i.e.  $\frac{1}{3}$ ) the size of the perimeter.



- 5.1.1 Calculate the length and the breadth of rectangle HIJK. (2)
- 5.1.2 If the length of the unshaded rectangle is  $\frac{3}{4}$  of IJ and the breadth  $\frac{1}{2}$  of HI, work out the perimeter of the unshaded portion. (2)

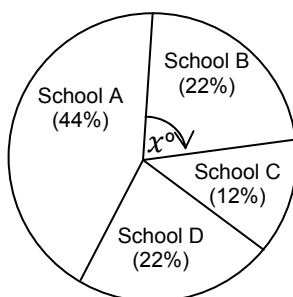
- 5.2 In the given cone below, the vertical height VO is 12 cm and the radius of the base circle OA is 5 cm. Determine the size of VA (slant height). (2)



[6]

### QUESTION 6

- 6.1 The pie chart below shows how R94 000 was allocated to 4 schools in a school district nutrition programme.



- 6.1.1 How much did school A receive? (1)
- 6.1.2 Find the value of  $x^\circ$ . (2)
- 6.1.3 School A decided to donate an amount of R 5 300 to School C. How much will School C have now? (2)

- 6.2 The stem and leaf diagram below represents the ages of 50 parents who attended a parents' meeting in Active Children J.S.S.

Stem	Leaf
7	1 2 3
6	1 2 2 3 5 9
5	1 2 3 4 5 6 7 7 9 9
4	1 1 2 2 3 4 4 5 6 6 9
3	2 2 3 4 5 6 7 8 8 9
2	1 2 3 4 8 9
1	7 8 8 9

6.2.1 Determine the range of the data. (1)

6.2.2 What is the median? (1)

6.2.3 Draw a frequency table to represent the data in intervals of 0 – 10; 11 – 20; 21 – 30;... (3)

- 6.3 The body mass in kilograms of the first 5 parents to arrive in the parents meeting are 51; 56; 54; 59 and 53. If the sixth parent arrive, their average body mass is 56 kg.

Calculate the body mass of the sixth parent. (3)

- 6.4 The table below shows the percentage of marks obtained by Aliva in 6 Mathematics tests in the second term.

Test Number	1	2	3	4	5	6
Marks as a Percentage	13	17	20	22	16	4

6.4.1 Draw a broken line graph to show Aliva's performance. (4)

6.4.2 Determine the average percentage of the test marks. (6)

- 6.5 A grade R class has bags where it keeps counters. One bag is carrying two green, one white and one black counter. One counter is randomly taken out, its colour noted and then put back into the bag. The bag is shaken and then a second counter is taken out at random.

Draw a tree diagram and use it to list all possible outcomes. (4)

- 6.6 What is the probability of randomly selecting ...

6.6.1 a white counter twice? (1)

6.6.2 a white and black counter? (1)

6.6.3 at least one black counter? (2)

[27]

**TOTAL: 100**

## ANNEXURE 1

SURNAME \_\_\_\_\_

NAME \_\_\_\_\_

DATE \_\_\_\_\_

## ANSWER SHEET FOR MULTIPLE CHOICE QUESTIONS

## QUESTION 1

Example:1.11  $\sqrt[3]{8}$  is ...

- A 24  
 B 2  
 C 2,7  
 D 512

The correct answer is **2** which is letter **B**.

1.11

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
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1.1

**A****B****C****D**

1.2

**A****B****C****D**

1.3

**A****B****C****D**

1.4

**A****B****C****D**

1.5

**A****B****C****D**

1.6

**A****B****C****D**

1.7

**A****B****C****D**

1.8

**A****B****C****D**

1.9

**A****B****C****D**

1.10

**A****B****C****D**

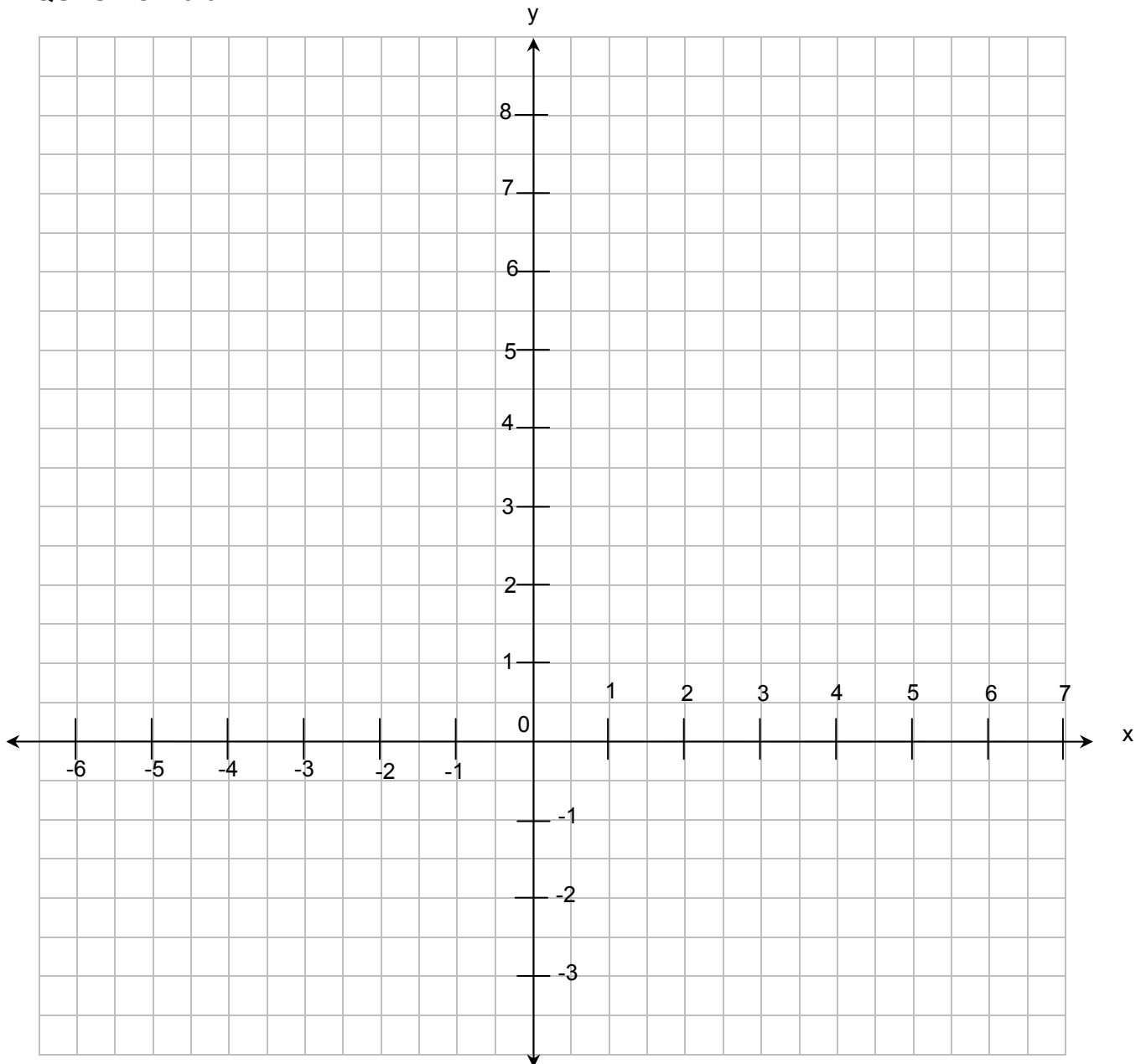
## ANNEXURE 2

SURNAME \_\_\_\_\_

NAME \_\_\_\_\_

DATE \_\_\_\_\_

## QUESTION 3.6.1



## ANNEXURE 3

SURNAME \_\_\_\_\_

NAME \_\_\_\_\_

DATE \_\_\_\_\_

## QUESTION 4.3.2

