



Province of the
EASTERN CAPE
EDUCATION

SENIOR PHASE

GRADE 9

NOVEMBER 2019

MATHEMATICS

MARKS: 100

TIME: 2 hours



This question paper consists of 16 pages, including 2 annexures.

INSTRUCTIONS AND INFORMATION

Read the instructions for each question carefully before answering the questions.

1. This paper consists of TEN (10) questions and a diagram sheet for QUESTIONS 5.2.1 and 7.1.1.
2. Answer ALL the questions.
3. Number your answers exactly as the questions are numbered in the question paper.
4. You may use an approved scientific calculator (non-programmable and non-graphical).
5. Clearly show ALL the calculations, diagrams and graphs etc. you have used in determining your answers.
6. Diagrams are NOT necessarily drawn to scale.
7. If necessary round off to TWO decimal places unless otherwise stated.
8. Answers alone will not necessarily earn full marks.
- 9 Write neatly and legibly.

QUESTION 1

Various options are given as possible answers to the following questions. Choose the answer and write only the letter (A–D) next to the question number, for example if the correct answer for 1.1 is A, write your answer only as 1.1 A.

1.1 Which of the following numbers is rational?

A $\sqrt{3}$

B $\sqrt{16}$

C $\sqrt{-9}$

D $\sqrt{13}$

(1)

1.2 There are 120 learners in Grade 8 at Greenview High School. If the ratio of girls to boys is 3 : 5, how many boys are there in Grade 8?

A 75

B 55

C 15

D 8

(1)

1.3 Convert the following number to scientific notation: 0,00000000089123.

A $0,00000000089123 \times 10^{10}$

B $8,9123 \times 10^{10}$

C $8,9123 \times 10^{-10}$

D $89,123 \times 10^{-10}$

(1)

1.4 If $(x - 1)(x + 2) = 0$ then $x = \dots$

A -1 or 0

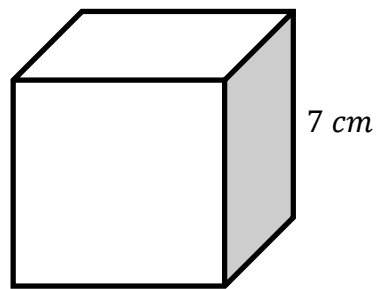
B 1 or -2

C 1

D -2

(1)

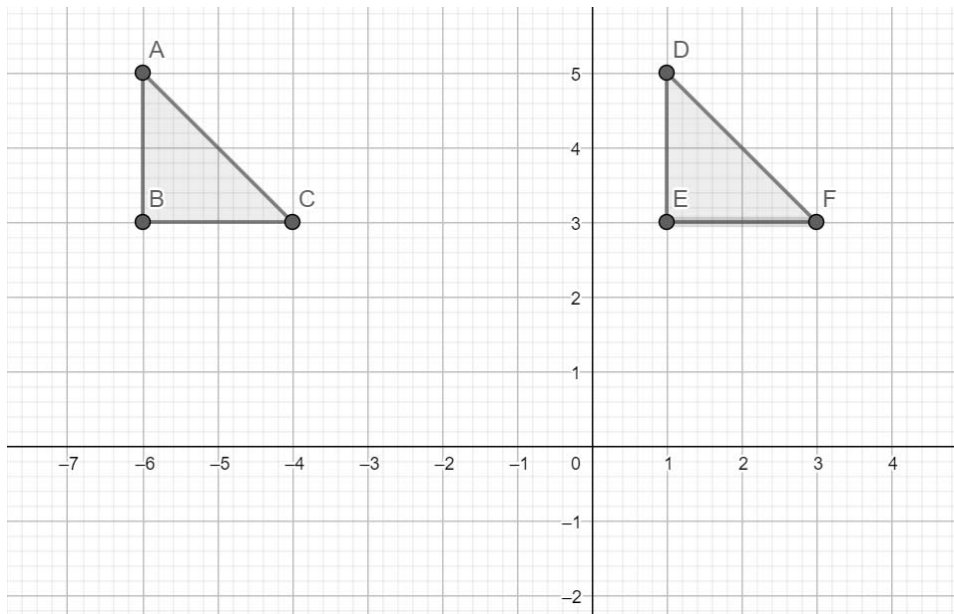
1.5 What is the volume of a cube with the side length equal to 7 cm?



- A 49 cm^3
- B 28 cm^3
- C 343 cm^3
- D 14 cm^3

(1)

1.6 The transformation of $\triangle ABC$ to $\triangle DEF$ is called ...



- A a reflection.
- B a reduction.
- C an enlargement.
- D a translation.

(1)

1.7 The next number in the sequence 1 ; 9 ; 25 ; ... is:

- A 33
- B 36
- C 49
- D 50

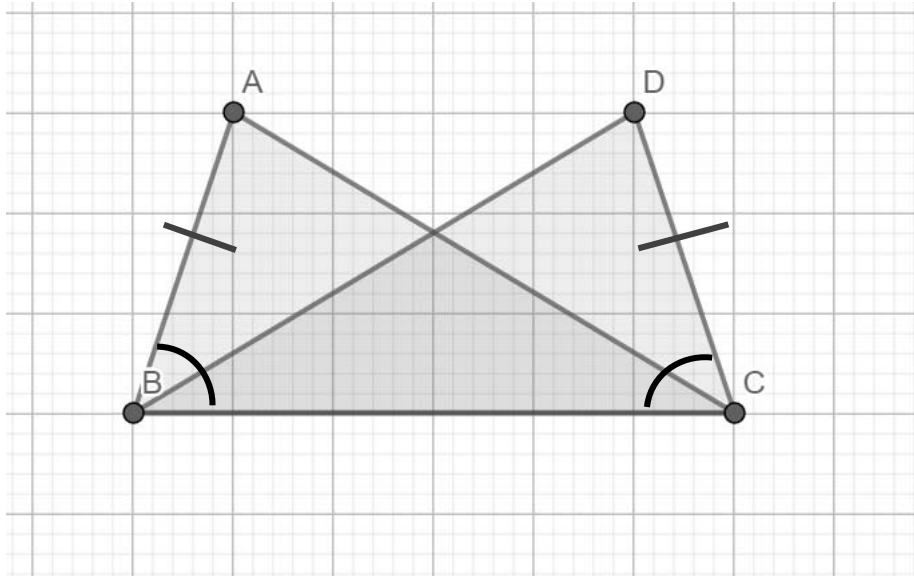
(1)

1.8 Which 3-D figure has 5 faces, 5 vertices and 8 edges?

- A Cylinder
- B Dodecahedron
- C Square-based pyramid
- D Triangular-based pyramid

(1)

1.9 Why is $\triangle ABC \equiv \triangle DCB$?



- A S, S, S
- B $90^\circ, \text{hyp}, S$ (R,H,S)
- C $S, <, S$
- D $<, <, S$

(1)

1.10 What will the probability be if an odd number is picked from a list of numbers from 1–13?

- A $\frac{6}{13}$
- B $\frac{7}{13}$
- C $\frac{1}{13}$
- D $\frac{1}{2}$

(1)
[10]

QUESTION 2

2.1 Simplify the following:

$$2.1.1 \quad \frac{4p^2q}{pq^3} \div \frac{10pq}{p^2q^3} \quad (3)$$

$$2.1.2 \quad \frac{3x + 6y}{x + 2y} \quad (2)$$

2.2 Find the product of the following:

$$2.2.1 \quad 3x(2x^2 - 5x - 4) \quad (2)$$

$$2.2.2 \quad (x + 3)(x - 4) \quad (2)$$

$$2.2.3 \quad (x - 5)^2 - (x + 5)(x - 5) + 10x \quad (4)$$

2.3 Factorise the following completely:

$$2.3.1 \quad 3a^2b^3 - 12a^4b \quad (3)$$

$$2.3.2 \quad x^2 - 3x - 10 \quad (2)$$

$$2.3.3 \quad 4x(a - b) + 3(b - a) \quad (3)$$

2.4 Solve for x :

$$\frac{3x - 1}{2} - \frac{2x}{3} = 2 \quad (3)$$

[24]

QUESTION 3

3.1 Philani sees the following advert:



SCOOTER FOR SALE
R15 000 CASH
HIRE PURCHASE AGREEMENT
AVAILABLE

Since he cannot afford to pay cash for the scooter, he opts for the hire purchase agreement which states the following:

15% deposit
24 monthly equal instalments
Interest rate: 10% per annum

- 3.1.1 How much will his deposit be? (1)
- 3.1.2 Calculate the total amount that he must still pay. (3)
- 3.1.3 Calculate the monthly instalments. (2)
- 3.2 Bongiwe invested a certain amount into a savings account at 6,5% compound interest per annum. If the final amount is R15 300 after 5 years, how much did she originally invest? (3)

[9]

QUESTION 4

4.1 Write down the next term in the given sequence:

$$3 \ ; \ 8 \ ; \ 13 \ ; \ \dots \quad (1)$$

4.2 Describe the pattern in QUESTION 4.1 in words. (1)

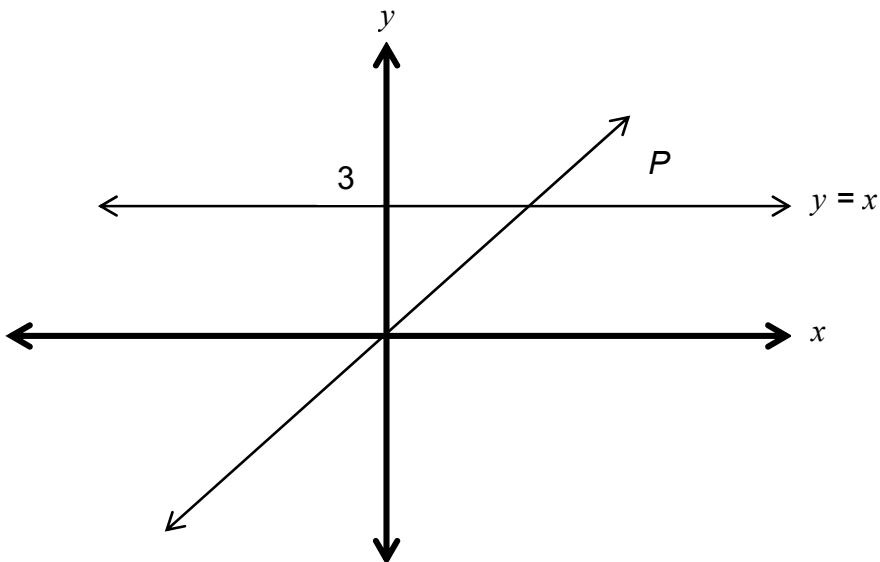
4.3 Write down the general term of the given sequence in the form $T_n = \underline{\hspace{2cm}}$ (2)

4.4 Which term in the sequence is equal to 38? (3)

[7]

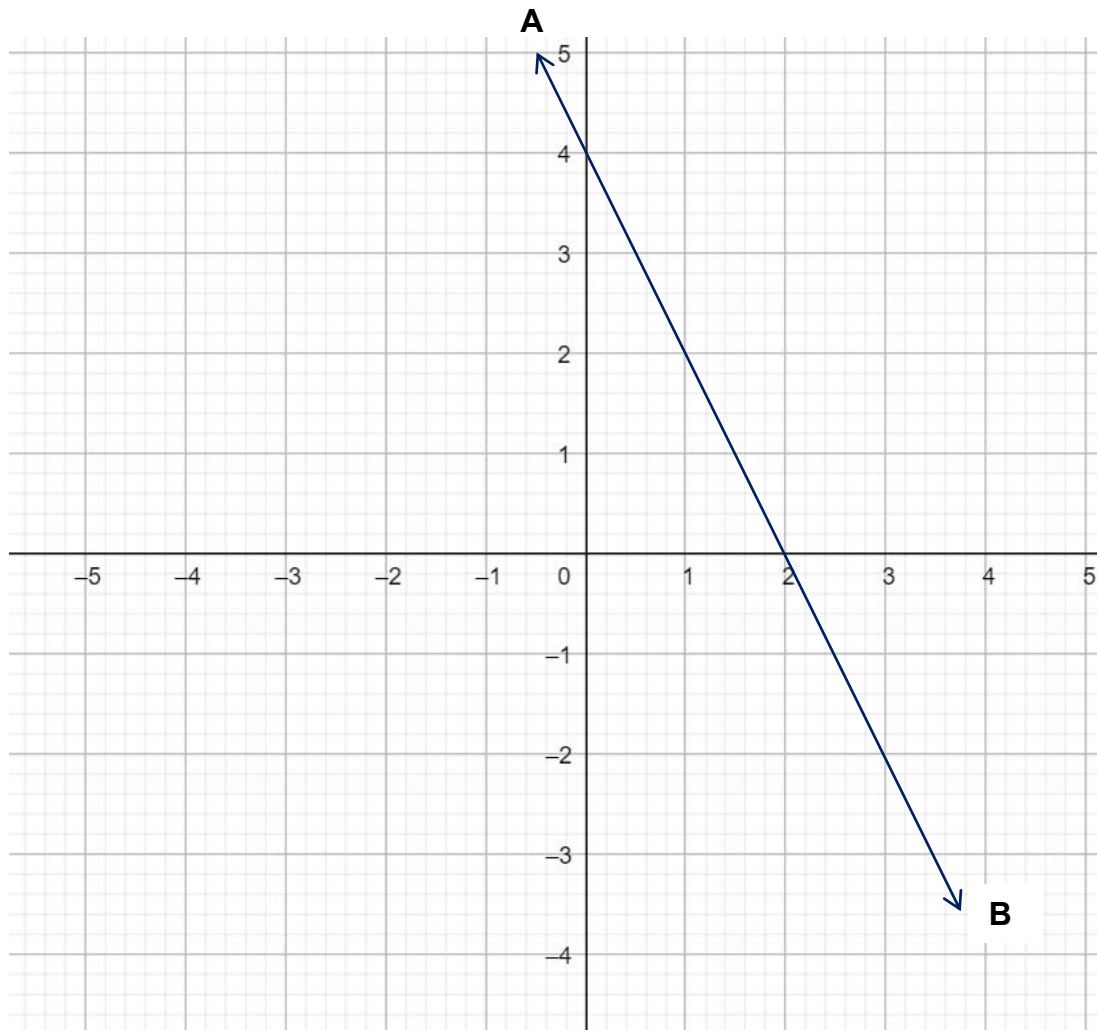
QUESTION 5

Study the graphs below.



5.1 What are the co-ordinates of P (the intersection of the two graphs)? (1)

5.2 On the Cartesian plane below, the graph $y = -2x + 4$ is shown.

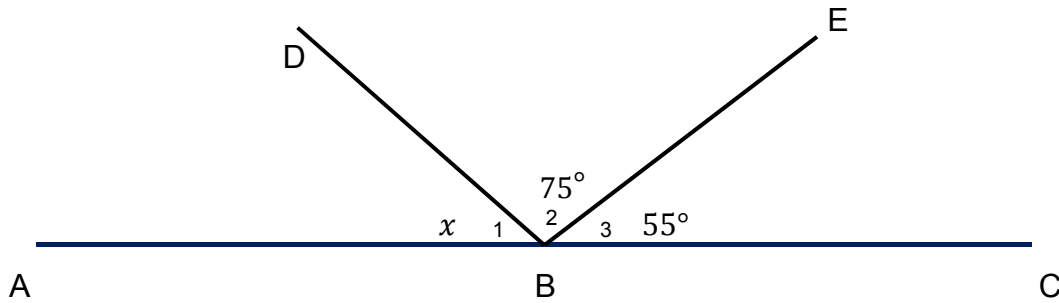


5.2.1 On the ANNEXURE provided, draw the straight line graph represented by $y = -2x - 4$. (Indicate all intercepts and label your graph CD.) (3)

5.2.2 What can you deduce about the two graphs, AB and CD? Give a reason for your answer. (2) [6]

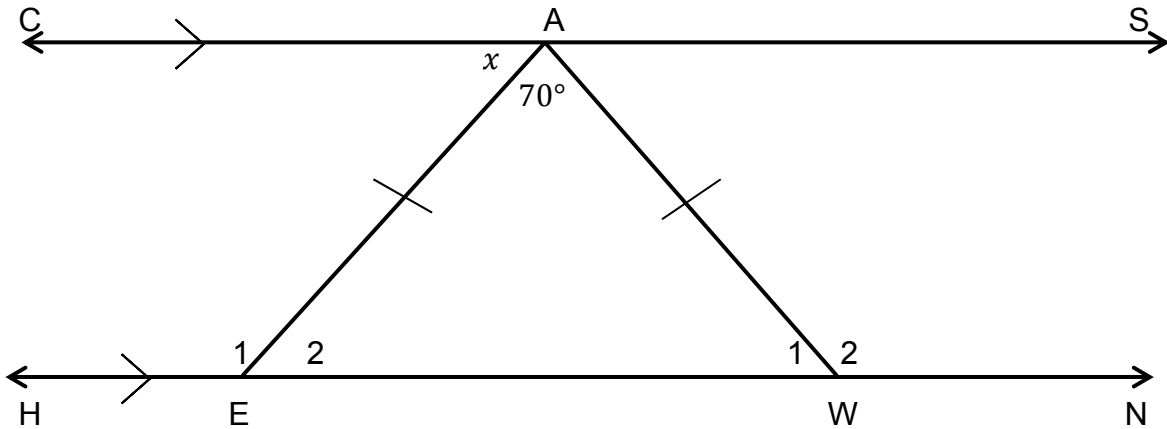
QUESTION 6

6.1 In the figure below, ABC is a straight line, $\hat{B}_2 = 75^\circ$ and $\hat{B}_3 = 55^\circ$.



Determine, with reasons, the size of x . (2)

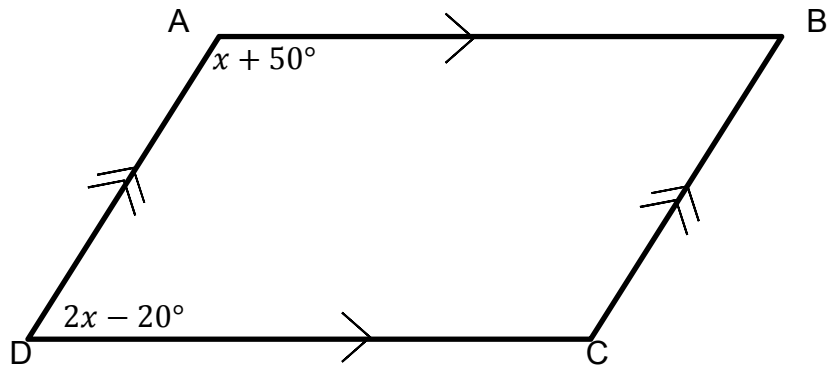
6.2 In the figure below, $CS \parallel HN$, $E\hat{A}W = 70^\circ$, $AE = AW$ and $C\hat{A}E = x$.



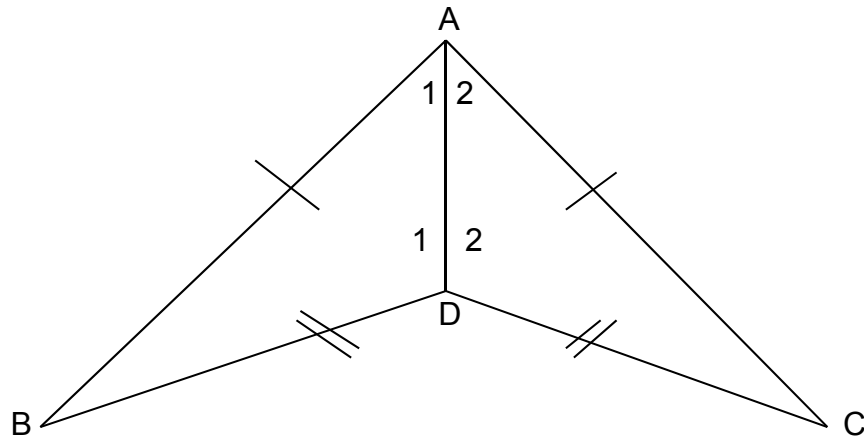
6.2.1 Give a reason why $\hat{E}_2 = x$. (1)

6.2.2 Hence, determine the value of x . (3)

6.3 $ABCD$ is a parallelogram. Calculate the size of \hat{B} . (4)



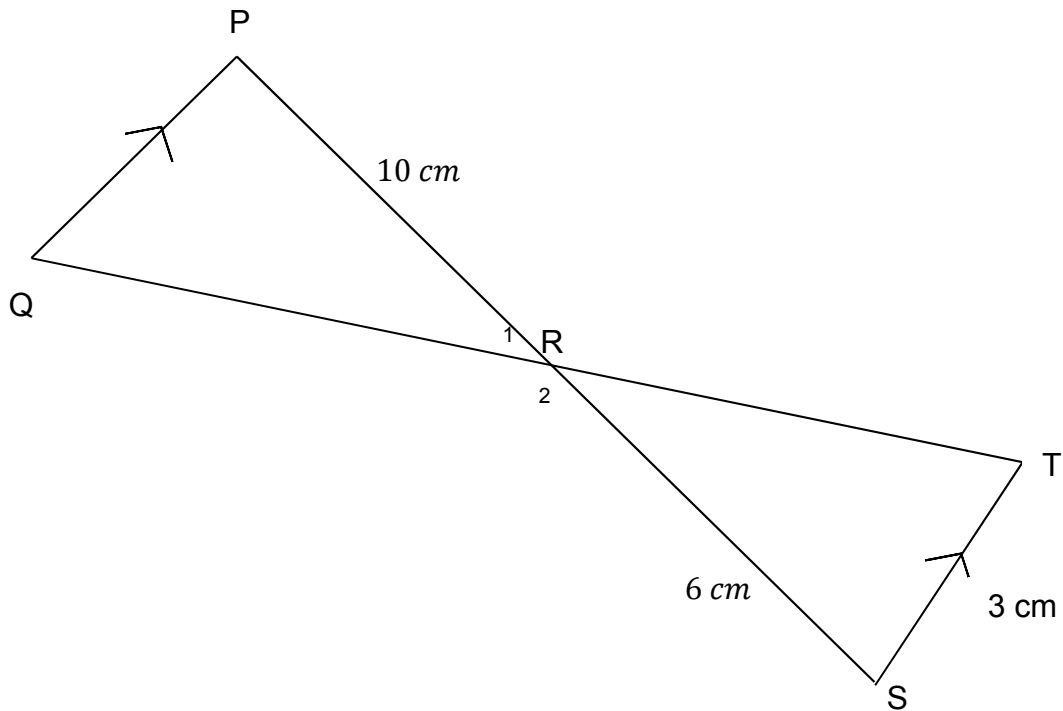
6.4 In the figure below, $AB = AC$ and $BD = CD$.



6.4.1 Prove that $\triangle ABD \equiv \triangle ACD$. (4)

6.4.2 Hence, prove that DA bisects $B\hat{A}C$. (1)

6.5 In $\triangle PQR$ and $\triangle STR$, $PQ \parallel ST$, $PR = 10\text{ cm}$, $ST = 3\text{ cm}$ and $SR = 6\text{ cm}$.



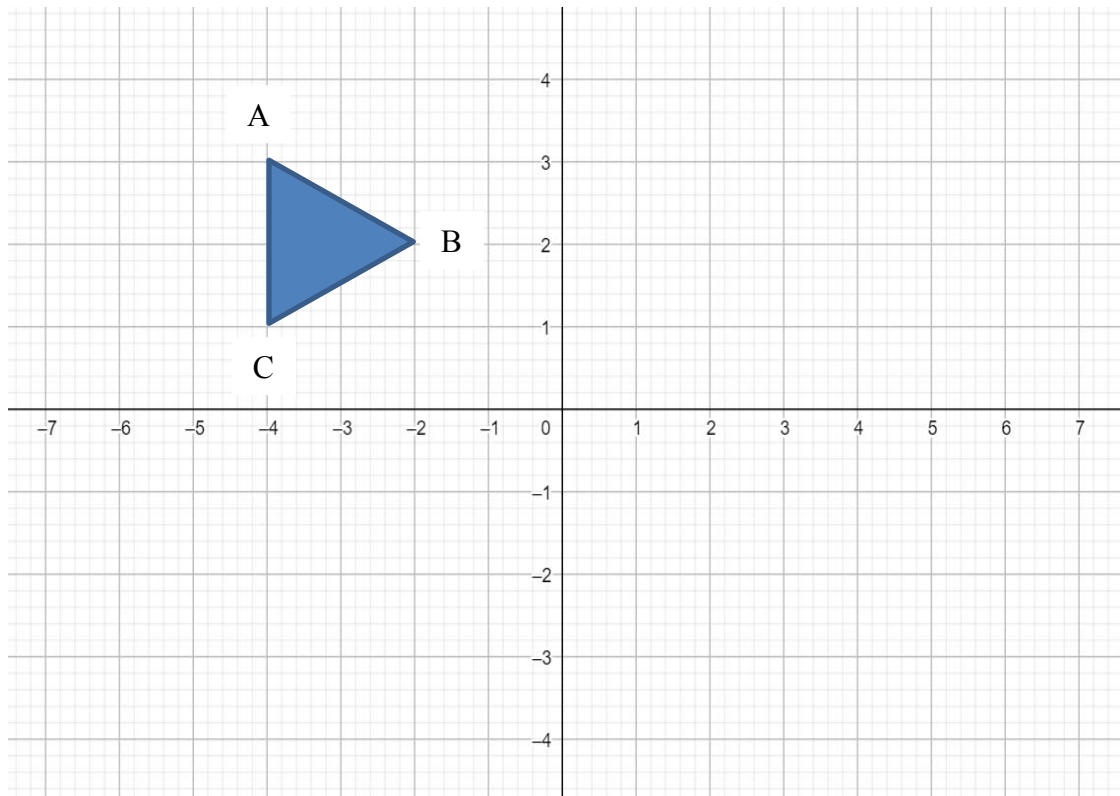
6.5.1 Show that $\triangle PQR \sim \triangle STR$. (4)

6.5.2 Calculate the length of PQ. (3)

[22]

QUESTION 7

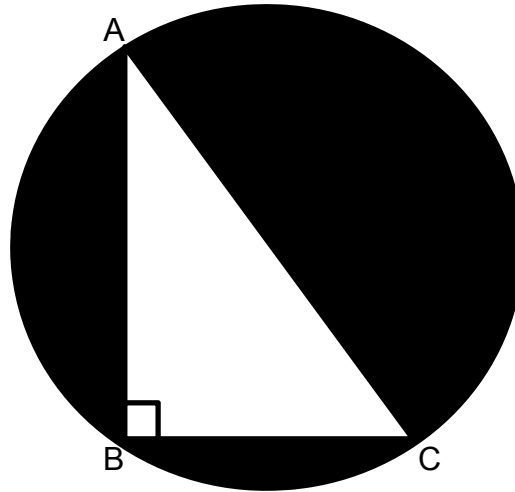
7.1 Study the diagram below.



- 7.1.1 Using the ANNEXURE, reflect the object about the y-axis from the diagram above. (2)
- 7.1.2 Write the rule that you used to reflect the object in QUESTION 7.1.1 in the form:
 $(x, y) \rightarrow (\dots; \dots)$ (1)
- [3]**

QUESTION 8

- 8.1 $\triangle ABC$ is inscribed in the circle below. $AC = 5 \text{ cm}$, $BC = 4 \text{ cm}$. AC is the diameter of the circle.

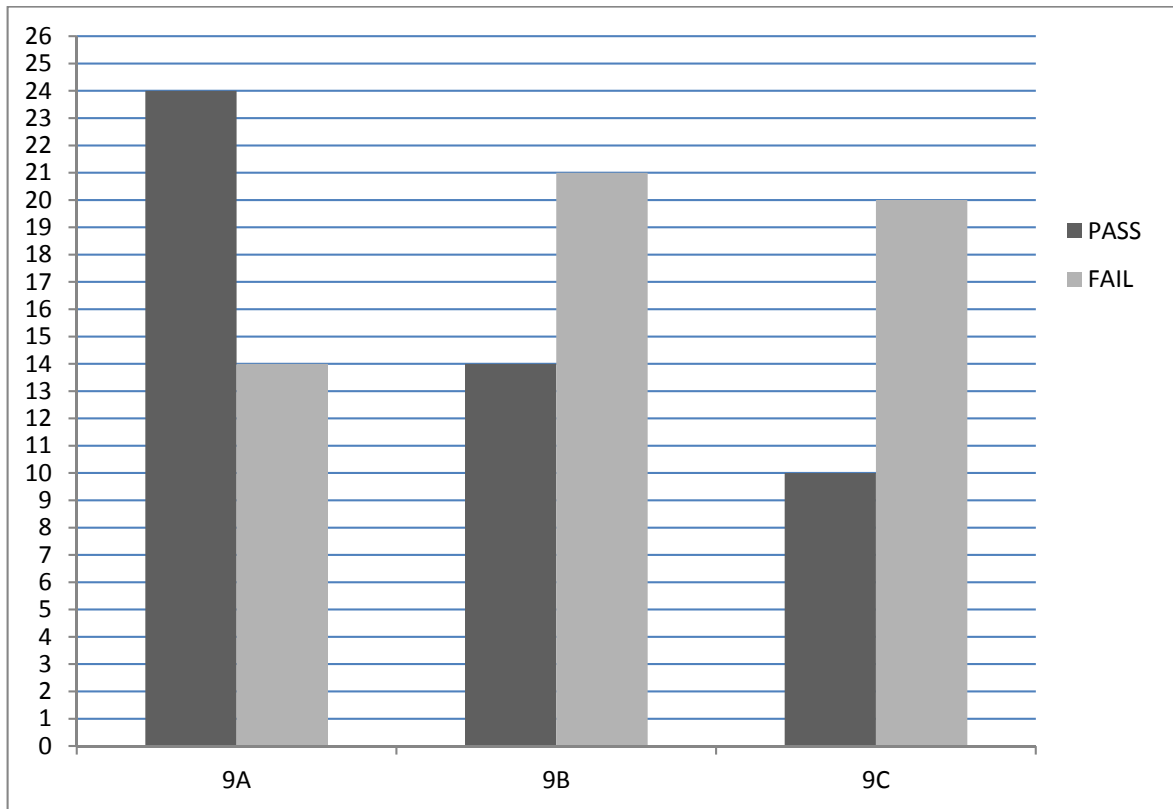


- 8.1.1 Calculate the length of AB . (2)
- 8.1.2 Calculate the area of $\triangle ABC$ and the area of the circle.
NOTE: Use $\pi = 3,14$. Round off to 1 decimal place. (3)
- 8.1.3 Hence, calculate the shaded area. (1)
- 8.2 Determine the volume of a cylinder if it has the following dimensions:
 $r = 7 \text{ cm}$ and $h = 20 \text{ cm}$.
NOTE: use $\pi = 3,14$. Round off to 1 decimal place. (3)

[9]

QUESTION 9

The double bar graph below shows the results of a mathematics test in three Grade 9 classes.



- 9.1 Which class had the most learners who passed the test? (1)
- 9.2 What is the mean of the learners who failed in total (all three classes)? (2)
- 9.3 Use your answer in QUESTION 9.2 and voice your opinion if you think the teacher will be happy with the marks represent above. Give a reason for your answer. (2)
- [5]**

QUESTION 10

A coin is tossed and a dice is rolled.

- 10.1 Represent the above scenario in a tree diagram. (2)
- 10.2 How many different possible outcomes are there? (1)
- 10.3 What is the probability of getting a tail and rolling a prime number? (2)
- [5]**

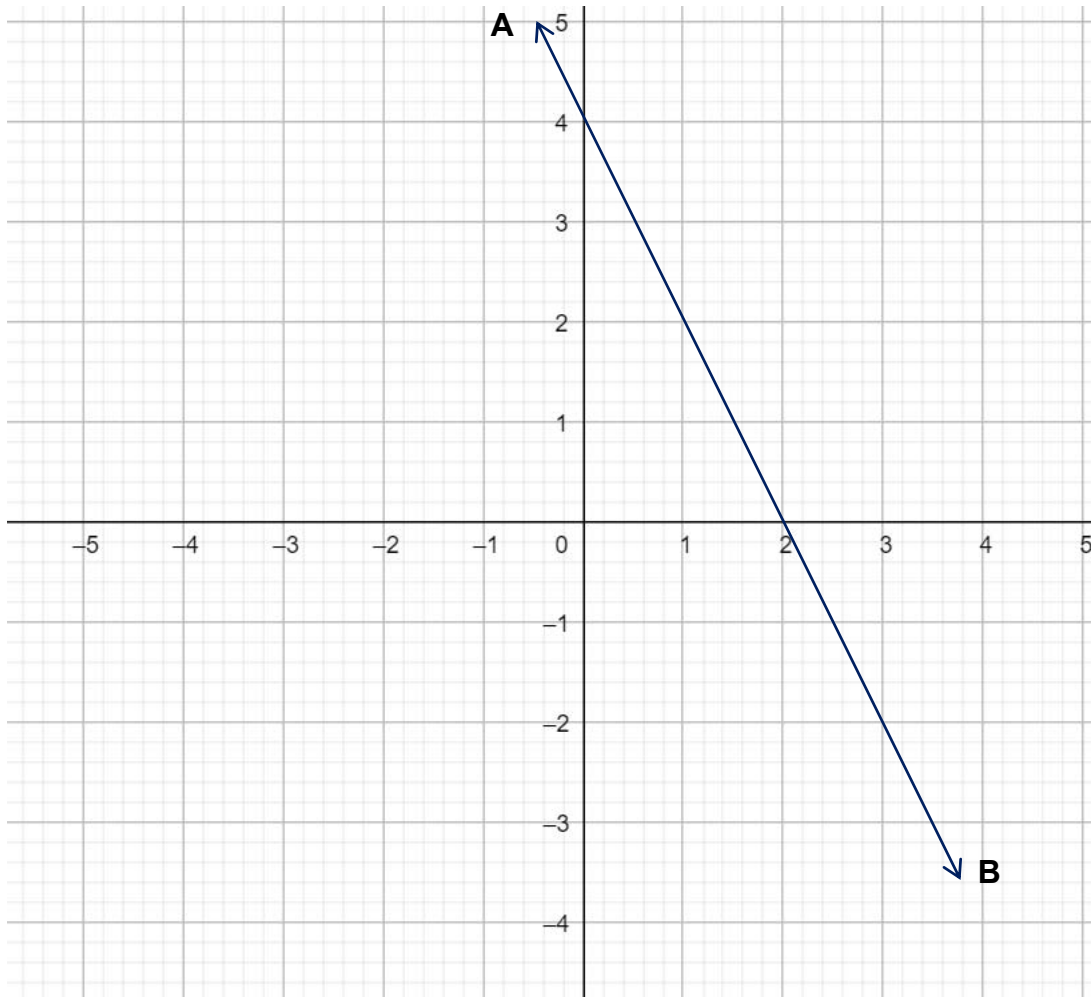
TOTAL: 100

ANNEXURE

QUESTION 5.2.1

NAME: _____

SURNAME: _____



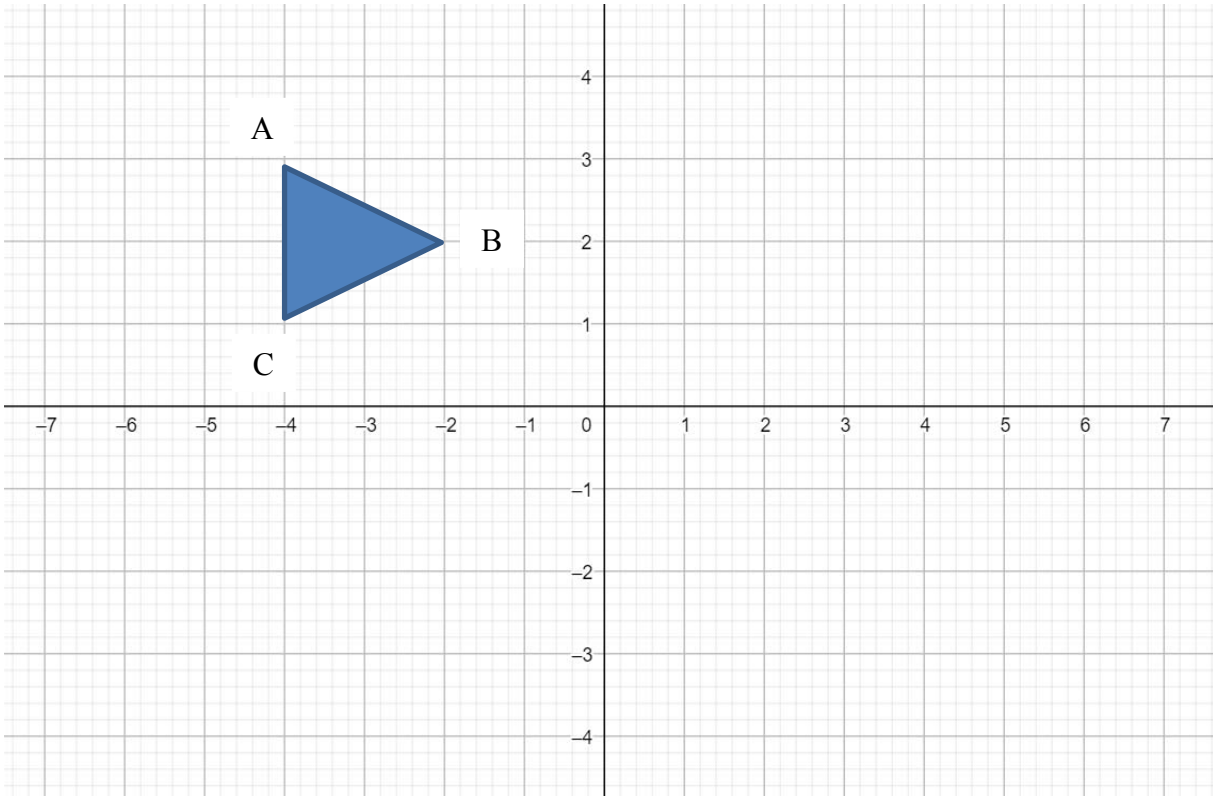
(3)

ANNEXURE

QUESTION 7.1.1

NAME: _____

SURNAME: _____



(2)

