BERGVLIET HIGH SCHOOL

MATHEMATICS DEPARTMENT

NOVEMBER EXAMINATION

GRADE 8

MATHEMATICS PAPER 1
11 November 2024

MARKS: **75**
TIME: **90 MINUTES**
SET BY: **D. Viljoen**
MODERATOR : **D. Lekay**

This question paper consists of 5 questions and an answer sheet.

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. Answer QUESTION 1 and QUESTION 2 on the ANSWER SHEET. Staple the answer sheet to the FRONT of your other answers.
2. Clearly show ALL calculations, diagrams, graphs, etcetera that you have used in determining your answers.
3. Answers only will **not** necessarily be awarded full marks.
4. You may use an approved scientific calculator (non-programmable and non-graphical), unless stated otherwise.
5. If necessary, round off answers to TWO decimal places, unless stated otherwise.
6. Diagrams are NOT necessarily drawn to scale.
7. Number the questions correctly according to the numbering system used in this question paper.
8. Write neatly and legibly.

Q1 [10]	**Q2** [6]	**Q3** [27]	**Q4** [11]	**Q5** [21]	**TOTAL [75]**

ANSWER SHEET

(Attach to the front of the rest of your answers)

NAME:_____ CLASS:_____

MATHS TEACHER (circle correct): Jo / Le / Vi / Wh / Eb / Si / Fg

QUESTION 1 (Circle correct):

1.1	A	B	C	D	**1.6**	A	B	C	D
1.2	A	B	C	D	**1.7**	A	B	C	D
1.3	A	B	C	D	**1.8**	A	B	C	D
1.4	A	B	C	D	**1.9**	A	B	C	D
1.5	A	B	C	D	**1.10**	A	B	C	D

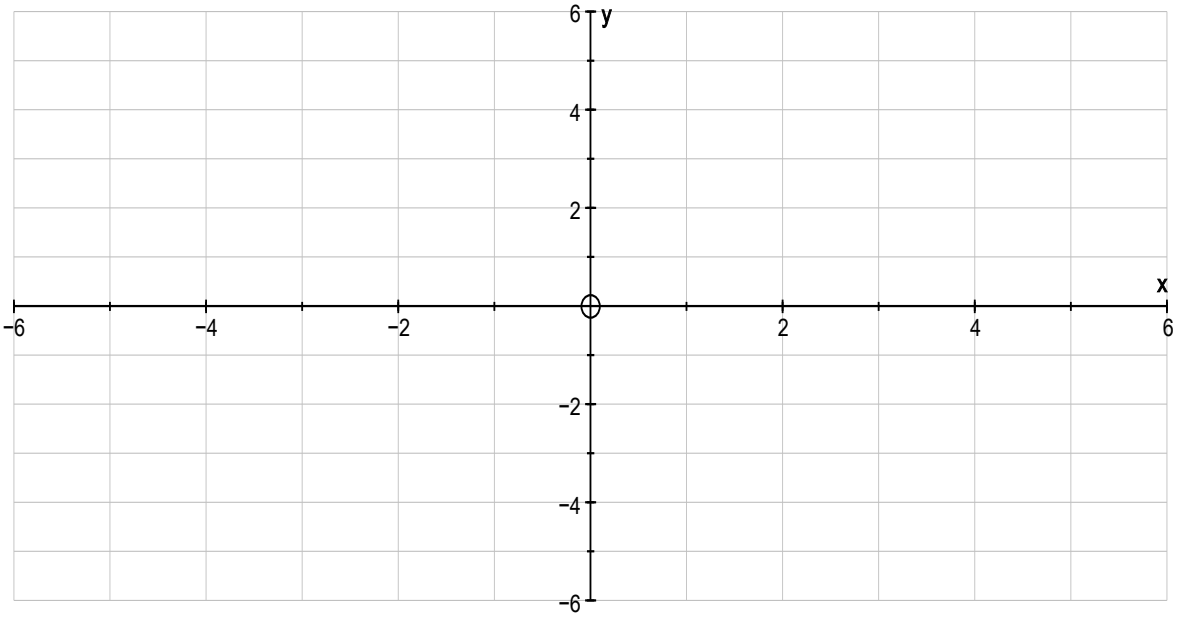
[10]

QUESTION 2 (Complete the table and graph below):

Complete the table, then join some of these points provided, to accurately draw the graph of:

$$y = 2x - 4$$

x	-2	0		2	
y			0		24



[6]

QUESTION 1: Multiple Choice

Answer the following questions on the answer sheet provided.

1.1. Consider the following list of numbers:

$$-4\ ;\ 2.5\ ;\ 7\ ;\ \sqrt{16}\ ;\ -\frac{5}{2}\ ;\ \pi$$

Which of the following options contains only **positive whole numbers**? (1)

A. $7\ ;\ \sqrt{16}$

B. $-4\ ;\ \pi$

C. $2.5\ ;\ 7$

D. $-\frac{5}{2}\ ;\ \pi$

1.2. From the list:

$$\sqrt{3}\ ;\ 3.141\ ;\ \frac{1}{2}\ ;\ 5\ ;\ -0.333$$

Identify the option that lists only **rational numbers**. (1)

A. $\frac{1}{2}\ ;\ 5\ ;\ -0.333$

B. $\sqrt{3}\ ;\ 3.141$

C. $\sqrt{3}\ ;\ \frac{1}{2}$

D. None of the above

1.3. Which of these sequences represents **only factors** of 48? (1)

A. $4\ ;\ 7\ ;\ 14\ ;\ 28$

B. $5\ ;\ 10\ ;\ 20\ ;\ 25$

C. $8\ ;\ 12\ ;\ 16\ ;\ 24$

D. $6\ ;\ 9\ ;\ 12\ ;\ 15$

1.4. Which ratio is **equivalent** to $\frac{18}{24}$? (1)

A. 24:18

B. 9:12

C. 4:3

D. 3:4

1.5. If a prize of R150 is shared between two people in the ratio $3:2$, how much does each person receive? (1)

A. R90 and R60

B. R100 and R50

C. R120 and R30

D. R70 and R80

1.6. Estimate the result of 3.849×1.27 by rounding each value to one decimal place. (1)

A. 4.9 B. 5.0

C. 5.1 D. 5.2

1.7. An item costs R45 before a 15% discount. What is the discounted price? (1)

A. R42.75 B. R38.25

C. R40.50 D. R39.00

1.8. In the expression $-3x^2 + 4x - 7$, what is the coefficient of x? (1)

A. 4 B. -3

C. 3 D. -7

1.9. In each option, x and y values are paired as coordinates. Which option below shows a relationship where the same x-value **does not** lead to different y-values? (1)

A. $(1,2)$; $(2,3)$; $(3,3)$; $(1,4)$ B. $(0,1)$; $(1,2)$; $(2,3)$; $(3,4)$

C. $(2,3)$; $(2,4)$; $(2,5)$; $(2,6)$ D. $(4,1)$; $(5,2)$; $(4,3)$; $(5,4)$

1.10. A rule says: "Double the starting number and then add 3 to get -11." What was the starting number? (1)

A. -4 B. -6

C. -5 D. -7

[10]

QUESTION 2: Functions and Graphs

Consider the following function:

$$y = 2x - 4$$

2.1.1. Complete the table provided on the ANSWER SHEET. (2)

2.1.2. Use the table to assist you in drawing the graph of this function on the Cartesian plane. Be sure to label the graph clearly and indicate the coordinates of all points of intersection with the axes (4)

[6]

The remaining questions are to be answered on the lined paper provided.

QUESTION 3: Numbers, Operations and Relations

3.1. Insert the correct symbol (<, >, or =) between the pairs of numbers below by writing down the correct statement on your answer paper:

3.1.1. $\frac{3}{4} \square \frac{9}{15}$ (1)

3.1.2. $-5{,}12 \square -2{,}15$ (1)

3.2. Consider the number 120.

3.2.1. Express this number as a product of primes (in **exponential form)**. Remember to show your steps when using the prime tree or ladder method. (3)

3.2.2. Using your response for QUESTION 3.2.1, determine the smallest value for k, such that $120 \times k$ is a perfect square. (2)

3.3. Evaluate the following expressions WITHOUT THE USE OF A CALCULATOR, by showing all your working:

3.3.1. $-5 + 3 \times (2^3 - 14)$ (4)

3.3.2. $\frac{2^0}{3} + \frac{14}{\sqrt{49}}$ (4)

3.4. A recipe for a fruit salad requires the following fresh ingredients:

- 2 cups of strawberries
- 3 cups of blueberries
- 1 cup of kiwi

3.4.1. What is the **ratio of strawberries** to the **total amount of fruit** in the salad? Express your answer in the simplest form. (2)

3.4.2. If the cost of purchasing these ingredients is in the ratio of 30:20:15, identify the most expensive ingredient per batch of fruit salad. (2)

3.5. A train travels at an average speed of 80 km/h.

3.5.1. How long will it take the train to travel a distance of 240 km? (1)

3.5.2. If the train needs to make a routine stop of 3 minutes for every 20 km traveled, while maintaining this average speed, calculate the total time for the trip of 240 km (including all of the stops). (3)

3.5.3. Express this increase in time taken for the trip as a percentage. (2)

3.6. A tap fills half a tank in 6 minutes. How long will it take **four taps** to fill the same tank? (2)

[27]

QUESTION 4: Algebraic Expressions

4.1. Simplify the following expressions:

4.1.1. $-4x+9y-x-2y$ (2)

4.1.2. $-4a^3 \times 3a^2b^4$ (2)

4.1.3. $\dfrac{(2x^4)^2}{2(x^2)^3}$ (4)

4.2. Subtract $a+2b$ from twice the value of $a-4b$. (3)

[11]

QUESTION 5: Algebraic Equations

5.1. Solve for x in the following equations:

5.1.1. $x+3=-10$ (1)

5.1.2. $2(4+3x)=20$ (3)

5.1.3. $8-3(x-7)=x+5$ (4)

5.2. Determine whether $x=-\dfrac{1}{2}$ is a solution to the equation $4x+1=2(x-1)+2$.

(Remember to show all steps in your response, without the use of a calculator) (3)

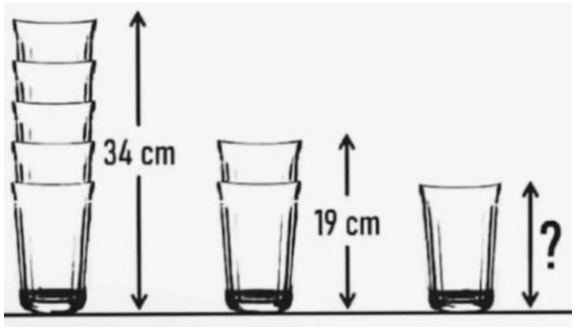
5.3. A bookstore is having a sale for new members. A book costs R150, but the store is offering a discount of R20 for each book purchased (including a once-off membership fee of R10).

5.3.1. What is the total sale price of three books, including the membership fee? (2)

5.3.2. If another new customer buys x books, write down a simplified algebraic equation which represents the total cost, y, of buying these books. (2)

5.3.3. Using your equation from QUESTION 5.3.2, solve for the number of books when the total amount spent is R790. (3)

5.4. By providing all reasons and calculations in your response, determine the height of a single cup (as shown below): (3)



[21]

TOTAL: 75 marks