education

Department of Education
FREE STATE PROVINCE

GRADE 9

MATHEMATICS

2026 MARCH

TEST

MARKS: 50

TIME: 1 hour

This question paper consists of 6 pages including cover page.

INSTRUCTIONS AND INFORMATION

- Read the all the instructions carefully before answering the questions.
- This question paper consists of 7 questions.
- Write legibly and present your work neatly.
- Answer **ALL** the questions.
- Clearly show **ALL** your calculations you have used in determining your answers.
- **Answers only** will **not** necessarily be awarded full marks.
- You may only use an approved scientific calculator (non-programmable and non-graphical), unless stated otherwise.
- Number the answers correctly according to the numbering system used in this question paper.

QUESTION 1

Consider the options and write down the letter of the correct option in your answer sheet.

1. Which of the following numbers is rational number? (1)

   A $\sqrt[3]{-9}$

   B $\sqrt{-17}$

   C $\sqrt[3]{8}$

   D $\sqrt{19}$

2. Simplify the expression : $3(2-6)+2(4-5-1)=\cdots$ (1)

   A -16

   B 16

   C 8

   D -8

3. 0, 00000625 in scientific notation is written as: (1)

   A 625×10^{-6}

   B $62{,}5\times10^{-6}$

   C $6{,}25\times10^{-6}$

   D $6{,}25\times10^{-5}$

4. Simplify: $a^3\times ac^2$ (1)

   A a^5c

   B a^4c^2

   C a^3c^2

   D a^6c^2

5. Which of these is equal to $2x - 3y + 7x + 5y$? (1)

A $5x + 2y$

B $5x - 2y$

C $9x + 2y$

D $9x - 8y$

[5]

QUESTION 2

2.1 There are 854 Learners in the School. How many boys are in the school, if $\frac{3}{7}$ of the Learners are girls? (3)

2.2 Use prime factorisation to show that 225 is a factor of $3^{50} \times 5^{30} \times 7^{20}$ (3)

2.3. R5 265 is invested at 12% per annum compound interest for 2 years. What will be the value of the investment after 2 years? (3)

[9]

QUESTION 3

3.1 Calculate $\sqrt[3]{\sqrt{16} - \sqrt{25}}$ without using a calculator. (3)

3.2 By using the commutative and associative properties, calculate:

$-33 + 103 - 102 + 3$ (2)

[5]

QUESTION 4

Simplify the following:

4.1 $9y^0 + (9y)^0 \times (-1)^9$ (2)

4.2 $(-2ab^2)^3$ (2)

4.3 $\left(\frac{y^2+\frac{1}{y^{-2}}}{y^2 \times y^2}\right)^{-2}$ (5)

[9]

QUESTION 5

5.1 Consider the sequence: −4; 2; 8; 14; ...

5.1.1 Write down the next two terms of the pattern. (2)

5.1.2 Determine the general (n^{th}) term of the pattern. (2)

5.2 Consider the geometric pattern made of matchsticks below:

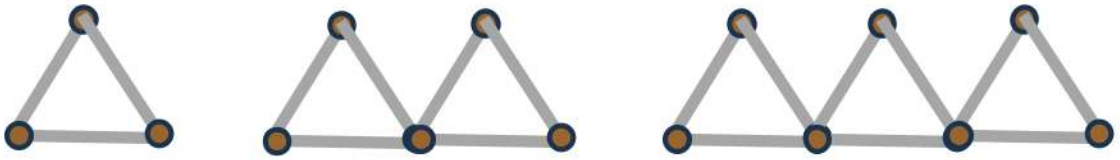


Figure 1 Figure 2 Figure 3

5.2.1 Draw figure 4 of the pattern. (1)

5.2.2 Determine the general term of the pattern in terms of number of matchsticks in the form $T_n =$. (2)

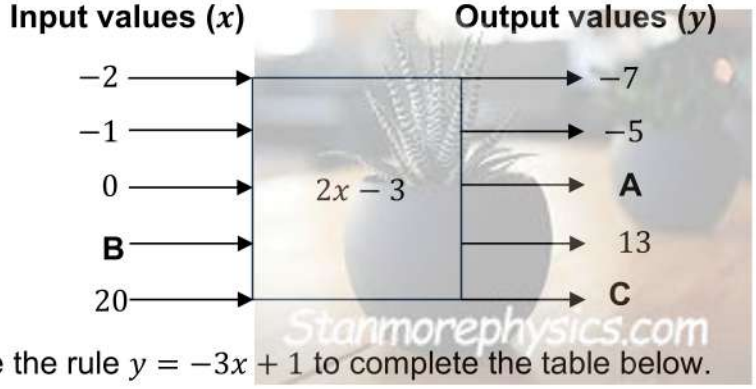
5.2.3 Determine number of matchsticks that will be in the 20th Figure. (2)

5.2.4 Which Figure will comprise of 96 matchsticks? (2)

[11]

QUESTION 6

6.1 Study the flow diagram below and determine the value of A, B and C. (4)



6.2 Use the rule $y = -3x + 1$ to complete the table below. (2)

Input values (x)	4	21
Output values (y)		

[6]

QUESTION 7

Consider the expression: $17x^3 + 8x^2 - x - 2$

7.1 What is the degree of the polynomial? (1)

7.2 Write down the coefficient of x. (1)

7.3 Write down the constant number. (1)

7.4 Evaluate the value of $17x^3 + 8x^2 - x - 2$ if $x = -1$ (2)

[5]

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MARKING GUIDELINES

This question paper consists of 8 pages including cover page.

QUESTION 1		
1.	Which of the following numbers is rational number? (1)	
Option	**Possible answers**	**Errors and Misconceptions**
A	$\sqrt[3]{-9}$	
B	$\sqrt{-17}$	
C	$\sqrt[3]{\mathbf{8}}$	✓ **Correct response**
D	$\sqrt{\mathbf{19}}$	
2.	Simplify the expression : $3(2-6)+2(4-5-1) = \cdots$ (1)	
Option	**Possible answers**	**Errors and Misconceptions**
A	$\mathbf{-16}$	✓ **Correct response**
B	16	
C	8	
D	-8	
3.	0, 00000625 in scientific notation is written as: (1)	
Option	**Possible answers**	**Errors and Misconceptions**
A	625×10^{-6}	
B	$62{,}5 \times 10^{-6}$	
C	$\mathbf{6,25 \times 10^{-6}}$	✓ **Correct response**
D	$6{,}25 \times 10^{-5}$	
4.	Simplify: $\boldsymbol{a^3 \times ac^2}$ (1)	
Option	**Possible answers**	**Errors and Misconceptions**
A	$\boldsymbol{a^5c}$	
B	$\boldsymbol{a^4c^2}$	✓ **Correct response**
C	a^3c^2	
D	a^6c^2	
5.	Which of these is equal to $\boldsymbol{2x - 3y + 7x + 5y}$? (1)	
Option	**Possible answers**	**Errors and Misconceptions**
A	$5x + 2y$	
B	$5x - 8y$	
C	$\boldsymbol{9x + 2y}$	✓ **Correct response**
D	$9x - 8y$	

QUESTION 2

2.1

There are 854 Learners in the School. How many boys are in the school, if $\frac{3}{7}$ of the learners are girls?

$\frac{3}{7} \times 854$ $\quad$ $\frac{4}{7} \times 854$

$= 366$ girls $\quad$ $= 488$ boys

Boys $= 854 - 366$

$= 488$ boys

✓ $\frac{4}{7}$
✓ $\frac{4}{7} \times 854$
✓ 488 (3)

OR

✓ $\frac{3}{7} \times 854$
✓ $854 - 366$
✓ 488 (3)

2.2

Use prime factorisation to show that 225 is a factor of $3^{50} \times 5^{30} \times 7^{20}$.

3	225
3	75
5	25
5	5
	1

$\frac{3^{50} \times 5^{30} \times 7^{20}}{3^2 \times 5^2}$

$= 3^{48} \times 5^{28} \times 7^{20}$

Or

$\mathbf{3^{50} \times 5^{30} \times 7^{20}}$

$= \mathbf{(3^5 \times 5^3 \times 7^2)^{10}}$

$= (3^2 \times 3^3 \times 5 \times 5^2 \times 7^2)^{10}$

✓ prime factorisation of 225
✓ $\frac{3^{50} \times 5^{30} \times 7^{20}}{3^2 \times 5^2}$
✓ $3^{48} \times 5^{28} \times 7^{20}$ (3)

✓ $\mathbf{(3^5 \times 5^3 \times 7^2)^{10}}$
✓ $= (3^2 \times 3^3 \times 5 \times 5^2 \times 7^2)^{10}$
✓ $\mathbf{3^2 \times 5^2}$ (3)

2.3

R5 265 is invested at 12% per annum compound interest for 2 years. What will be the value of the investment after 2 years?

$\boldsymbol{A = P(1+i)^n}$

$\boldsymbol{A = 5265(1 + 0,12)^2}$

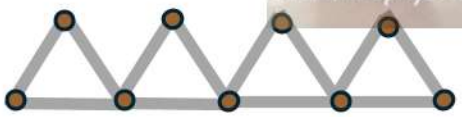
$\boldsymbol{= R6604,42}$

✓ formular
✓ substitution
✓ $\boldsymbol{R6604,42}$ (3)

[9]

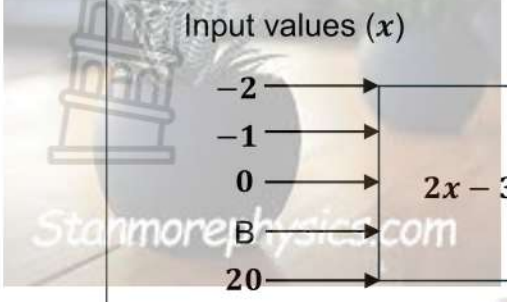
QUESTION 3		
3.1	Calculate $\sqrt[3]{\sqrt{16}-\sqrt{25}}$ without using a calculator. $\sqrt[3]{\sqrt{16}-\sqrt{25}}$ $=\sqrt[3]{4-5}$ $=\sqrt[3]{-1}$ $=-1$	✓ $\sqrt[3]{4-5}$ ✓ $\sqrt[3]{-1}$ ✓ -1 (3)
3.2	By using the commutative, and associative properties, calculate: $-33+103-102+3$ $=-33+3+103-102$ $=-30+1$ $=-29$ Or $-33+103-102+3$ $=-33-102+3+103$ $=-135+106$ $=-29$	✓ $-30+1$ ✓ -29 (2) ✓ $-135+106$ ✓ -29 (2)
		[5]

QUESTION 4		
Calculate		
4.1	$9y^0 + (9y)^0 \times (-1)^9$ $= 9 + 1 \times (-1)$ $= 9 + (-1)$ $= 8$	✓ $9 + 1 \times (-1)$ ✓ 8 (2)
4.2	$(-2ab^2)^3$ $= -8a^3b^6$	✓ -8 ✓ a^3b^6 (2)
4.3	$\left(\frac{y^2+\frac{1}{y^{-2}}}{y^2 \times y^2}\right)^{-2}$ $= \left(\frac{y^2+y^2}{y^4}\right)^{-2}$ ✓ $= \left(\frac{2y^2}{y^4}\right)^{-2}$ $= \left(\frac{2}{y^2}\right)^{-2}$ $= \left(\frac{y^2}{2}\right)^{2}$ $= \frac{y^4}{4}$	✓ y^2 ✓ $2y^2$ ✓ $\frac{2}{y^2}$ ✓ $\left(\frac{y^2}{2}\right)^2$ ✓ $\frac{y^4}{4}$ (5) Any correct changes for a learner must be awarded marks.
		[9]

QUESTION 5		
5.1	Consider the sequence: −4; 2; 8; 14; ...	
5.1.1	Write down the next two terms of the pattern. 20; 26;	✓ $\mathbf{20}$ ✓ $\mathbf{26}$ (2)
5.1.2	Determine the general ($\boldsymbol{n^{th}}$) term of the pattern. $\boldsymbol{T_n = 6n - 10}$	✓ $\mathbf{6n}$ ✓ $\mathbf{-10}$ (2)
5.2	Consider the geometric pattern made of matchsticks below: 	
5.2.1	Draw figure 4 of the pattern. 	✓ figure (1)
5.2.2	Determine the general term of the pattern in terms of number of matchsticks in the form $\boldsymbol{T_n =}$. $\boldsymbol{T_n = 3n}$	✓ ✓$\mathbf{3n}$ (2)
5.2.3	Determine number of matchsticks that will be in the 20th Figure. $\boldsymbol{T_{20} = 3(20)}$ $\boldsymbol{= 60}$	✓ substitution ✓ $\mathbf{60}$ (2)
5.2.4	Which Figure will comprise of 96 matchsticks? $\boldsymbol{96 = 3n}$ $\boldsymbol{32 = n}$	✓ substitution ✓ $\mathbf{32}$ (2)
		[11]

QUESTION 6

6.1 Study the flow diagram below and determine the value of A, B and C.



$y = 2x - 3$
$A = 2(0) - 3$
$A = -3$
$13 = 2B - 3$
$16 = 2B$
$8 = B$

$y = 2x - 3$
$C = 2(20) - 3$
$C = 37$

✓ -3
✓✓ 8
✓ 37 (4)
Answer only full marks.

6.2 Use the rule $y = -3x + 1$ to complete the table below.

Input values (x)	4	21
Output values (y)	-11	-62

$y = -3x + 1$
$y = -3(4) + 1$
$y = -11$

$y = -3x + 1$
$y = -3(21) + 1$
$y = -62$

✓ -11
✓ -62 (2)
Answer only full marks.

[6]

QUESTION 7			
Consider the expression: $\mathbf{17x^3 + 8x^2 - x - 2}$			
7.1	What is the degree of the polynomial? $\mathbf{3}$ or third degree	✓ answer	(1)
7.2	Write down the coefficient of $\boldsymbol{x}$. $\mathbf{-1}$	✓ answer	(1)
7.3	Write down the constant number. $\mathbf{-2}$	✓ answer	(1)
7.4	Evaluate the value of $\mathbf{17x^3 + 8x^2 - x - 2}$ if $\boldsymbol{x = -1}$ $\mathbf{= 17(-1)^3 + 8(-1)^2 - (-1) - 2}$ $\mathbf{= -10}$	✓ substitution ✓ $\mathbf{-10}$	(2)
			[5]