education

Department of Education
FREE STATE PROVINCE

GRADE 9

MATHEMATICS

JUNE MOCK TEST

2024

MARKS: 75

TIME: 2 HOURS

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INSTRUCTIONS AND INFORMATION

- Read all the instructions carefully before answering the questions.
- This question paper consists of 8 questions.
- Write legibly and present your work neatly.
- Answer ALL the questions.
- Clearly show ALL steps that you have used in determining your answers.
- Answers only will not necessarily be awarded full marks.
- You may 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.

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QUESTION 1

1.1 Which are the two missing numbers in the pattern below? (1)

3 ; 9 ; ____ ; 81 ; ____ ; 729

A 27 and 243

B 18 and 243

C 18 and 168

D 27 and 168

1.2 Which of the following is irrational? (1)

A $\sqrt{25}$

B $\sqrt{-21}$

C $\sqrt{1}$

D $\sqrt{23}$

1.3 Property demonstrated below is: (1)

$[(-7)+4]+(-8)=(-7)+[4+(-7)]$

A Identity property

B Associate property

C Commutative property

D Distributive property

1.4 Simplify $\frac{(y^5)^4(y^{-2})^{-5}}{(y^5)^6}$ (1)

A 1

B y^5

C y^{10}

D y^{-20}

1.5 How many terms do we have in the $2a + 3(5a + b)$ (1)

A 1

B 2

C 3

D 4

1.6 Write $(4 + 3) \times n \times m$ in a more simplified form mathematical convention. (1)

A $7nm$

B $nm7$

C $7mn$

D $mn7$

1.7 What is the coefficient of x in $\frac{-p}{4}$ is… (1)

A -1

B -4

C 4

D $-\frac{1}{4}$

1.8 If $2z(z - 5) = 0$ then $z =$ (1)

A 2 or -5

B 2 or 5

C 0 or 5

D 0 or -5

1.9 What is the additive and multiplicative inverses of -10? (1)

A 10 or $\frac{1}{10}$

B -10 or $-\frac{1}{10}$

C 10 or $-\frac{1}{10}$

D -10 or $\frac{1}{10}$

1.10 What is the constant term in the expression $\frac{f+g}{4} + 10 - 3f^2$ (1)

A 10

B 4

C 3

D -3

[10]

QUESTION 2

2.1 State whether the following STATEMENTS are true or false.

2.1.1 2,143 ... is an irrational number. (1)

2.1.2 $\sqrt[3]{-8}$ is non – real (1)

2.2 Use prime factors to determine $\sqrt[3]{4096}$. (4)

2.3 The ratio of boys to girls is 4:9. If there are 54 boys, how many girls are there? (3)

[9]

QUESTION 3

3.1 Consider the pattern: $-1; 1; 3; \ldots$

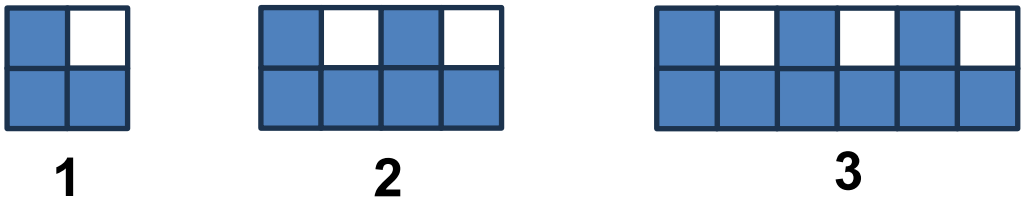
3.1.1 Write down the next term. (1)

3.1.2 Write down the constant difference. (1)

3.1.3 Write down the general rule of the pattern in the form $T_n =$ (2)

3.1.4 Which term in the sequence is equal to 47? (3)

3.2 Consider the pattern below:



3.2.1 Determine the number of unshaded squares in diagram 2000. (2)

3.2.2 Which diagram will contain 1000 unshaded squares? (2)

[11]

QUESTION 4

Calculate the following WITHOUT using a calculator:

4.1 $(-25) + 40 - (5) - 32$ (3)

4.2 $\sqrt{\frac{(-4)^2+\sqrt[3]{8}}{2}}$ (5)

[8]

QUESTION 5

Simplify the following:

5.1 $2(p)^0 - (2p)^0$ (2)

5.2 $\frac{-(-mn^3)^2 \times (-mn)^2}{(-m^2)^3 n^{10}}$ (6)

5.3 $(y+9)^2 - (y+2)(y-5)$ (4)

[12]

QUESTION 6

6.2 Factorise:

6.1.1 $8x^4y^3 - 12x^3y^4 + 16x^2y^5$ (2)

6.1.2 $a^2 - 5b - 6$ (2)

6.1.3 $c^2 - 64$ (2)

6.3 Simplify using factorisation:

$\frac{3y+6}{y^2+y-6} \times \frac{y-2}{3(y+1)} \div \frac{y+1}{y^2-1}$ (5)

6.3 **WITHOUT USING A CALCULATOR,** determine the value of

$133^2 - 132^2$ (4)

[15]

QUESTION 7

Solve the following equations:

7.1 $2x - 3 = -7$ (2)

7.2 $(p - 9)(p + 4) = 0$ (2)

7.3 $5^{m-1} = 125$ (3)

[7]

QUESTION 8

Determine the value of $\sqrt{k^2 + l^2}$ if $k = 6$ and $l = 8$ **[3]**