GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

PROVINCIAL EXAMINATION

JUNE 2023

GRADE 9

MATHEMATICS

EXEMPLAR

TIME: 1½ hours

MARKS: 75

14 pages

NAME OF LEARNER: _____ CLASS: _____

NAME OF SCHOOL: _____

INSTRUCTIONS AND INFORMATION

1. This question paper consists of 7 questions and 14 pages.

2. Answer ALL questions on the question paper.

3. A non-programmable calculator may be used, unless otherwise stated.

4. Clearly show ALL calculations, diagrams, and graphs that you have used in determining your answers. Answers only will not necessarily be awarded full marks.

5. If necessary, round-off your answers to 2 decimal places, unless otherwise stated.

6. Diagrams are not necessarily drawn to scale.

7. Answer QUESTION 1 in Section A by circling the letter next to the correct answer.

8. Answer QUESTIONS 2 to 7 in Section B in the spaces provided on the question paper.

9. Write neatly and legibly.

SECTION A

QUESTION 1

Answer questions 1.1 – 1.5 by choosing the correct answer. Circle the letter next to the correct answer.

1.1   Which equation illustrates the multiplicative inverse property?

  A $1 \times y = y$

  B $y \times \dfrac{1}{y} = 1$

  C $1 - 0 = 1$ (1)

  D $-1 \times y = -1$

1.2   Given the equation $4(x + 1) = 3x + 10$. For which value of x will this equation be true?

  A -6

  B 6

  C 9

  D -9 (1)

1.3   In the sequence $4; \frac{2}{3}; \frac{1}{9}; \frac{1}{?}; \dots$ the common ratio is

  A 6

  B $\dfrac{1}{12}$

  C $\dfrac{8}{3}$

  D $\dfrac{1}{6}$ (1)

1.4   What does **5*y* – 1** mean?

    A   Subtract 1 to 5 and multiply by *y*.
    B   Multiply 5 and *y* by negative 1.
    C   Add 5 and *y* and subtract 1.
    D   Multiply 5 and *y*, then subtract 1.   (1)

1.5   Consider the ratio below and determine which statement is NOT true.

    2 packets of chips : 8 pieces of chicken

    A   For every 8 pieces of chicken, there are 2 packets of chips.
    B   The ratio of packets of chips to pieces of chicken is 2:8.
    C   The ratio of packets of chips to pieces of chicken is 8:
    D   The ratio of pieces of chicken to packets of chips is :2.   (1)

                                                        [5]

SECTION B

QUESTION 2

2.1   The following ladders show the prime factors of 420 and 100.

420	2		100	2
210	2		50	2
105	3		25	5
35	5		5	5
7	7		1	
1				

2.1.1   Write down the HCF of 420 and 100.

_____ (1)

2.1.2   Write down the LCM of 420 and 100.

_____ (1)

2.2   Choose the correct term in the brackets to complete the sentence.

Zero (0) is _____ (an irrational **or** a rational) number.   (1)

2.3   Complete the table below by filling in the missing values:

Decimal fraction	Percentage
0,5	50%
0,7333...	2.3.1_____
2.3.2 _____	105%

(2)

2.4   At your local store, you get 3 stickers for every R60 spent.

    2.4.1   If you spend R480, how many stickers would you have?
Show ALL your calculations.

_____

_____

_____

_____   (2)

    2.4.2   By using the answer to QUESTION 2.4.1, would you say the relationship
between the amount spent and number of stickers earned is a direct proportion
or indirect proportion?

_____   (1)

2.5   R3 030,05 is invested for 5 years at 4,5% compound interest per annum. Calculate the
value of the investment (A) after 5 years. Round-off your answer to the nearest whole
number.

Formula: $A = P\left(1 + \frac{r}{100}\right)^n$ or $A = P(1 + i)^n$

_____

_____

_____

_____

_____   (4)

[12]

QUESTION 3

3.1 What is the additive inverse of 13?

_____ (1)

3.2 Study the number pattern below:

2 – 2 = 0
2 – 1 = 1
2 – 0 = 2

What will the next line in the pattern be? Show ALL your calculations.

_____

_____ (2)

3.3 Calculate the following WITHOUT using a calculator. Show ALL your calculations. Leave answers in the simplest form.

3.3.1 $\dfrac{-\sqrt{36}}{(-1)^3 - 2^3}$

_____

_____

_____

_____ (3)

3.3.2 $3 + 6 \times 6 + \ldots 5 - 7$

_____

_____

_____

_____

_____ (3)

[9]

QUESTION 4

4.1 $\sqrt[3]{64}$; 0,8; 1^3; $\frac{9}{2}$; 9; $\sqrt{25}$

Arrange the above numbers in descending order.

_____ (2)

4.2 Use the symbol = ; > or < to make the following statement TRUE:

$\sqrt[3]{64}$ _____ $\sqrt{64}$ (1)

4.3 The following statements are INCORRECT. Write down the correct answer.

4.3.1 $5^{-1} = -5$

_____ (1)

4.3.2 $(pq)^0 = p$

_____ (1)

4.4 Simplify the following expression:

$\dfrac{16a^2b}{3a^{-3}b^2} \div \dfrac{8a^3b}{9a^4b}$

_____

_____

_____

_____

_____

_____ (4)

[9]

QUESTION 5

5.1 Given the number sequence : 1; 8; 27; 64; 125; …

Write down the next term of the sequence.

_____ (1)

5.2 Two friends were texting each other back and forth. They were using the heart eyes emoji with every text forming the following pattern:

1st Text   2nd Text   3rd Text

5.2.1 Complete the table below by writing down the number of heart eyes in each text.

Text	1	2	3
Number of Hearts			

(1)

5.2.2 Use the numerical pattern derived in QUESTION 5.2.1 by the heart eyes to determine the general term in the form $T_n =$ _____.

_____

_____ (2)

5.2.3 If the friends continue using emojis as observed above, how many hearts would there be in the 15th text?

_____

_____

_____

_____ (2)

5.2.4   How many texts were sent if there are 39 emoji faces?

_____

_____

_____

_____   (3)

5.3   The heights and widths of boxes used to store files in a shop (in cm) is given below.

Height of the box (in cm)	Width of the box (in cm)
30	8
60	16
90	24
120	3

What is the width of a box that has a height of 45 cm?

_____

_____

_____   (2)

[11]

QUESTION 6

6.1   Choose the correct answer in brackets.

A (variable/constant) is a number that does not have a fixed value.   (1)

_____

6.2   State if the following statement is True or False:

$x^2 + 9 = (x + 3)(x - 3)$

_____   (1)

6.3   Subtract $(2p + pq)$ from $(-12p + 12pq)$.

_____

_____

_____   (2)

6.4   Expand and simplify:
$(ab^2 + b)^2$

_____

_____   (2)

6.5   Factorise:

$3x^2 + 12x$

_____

_____

_____

_____   (4)

6.6   Simplify the following expressions:

6.6.1   *6p – 4 + 2(2p + 3)*

_____

_____

_____   (2)

6.6.2 $\dfrac{b^2 + 5b}{b^2 - 25} \times \dfrac{3b^2 - 15b}{6b}$

_____

_____

_____

_____

_____   (4)

[16]

QUESTION 7

7.1   Write the following statement in the form of an algebraic equation.

Four times the sum of twice a number and six equals thirty-two.

_____   (1)

7.2   During the class discussion, Mary and Rose disagree on the answer to the equation:
$d(d – 2) = (d + 4) (d – 3)$. Rose says the answer is $d = –12$, while M___ ___ys the answer
is $d = 4$. Determine who is correct.(Show ALL your calculations

_____

_____

_____

_____

_____   (4)

7.3   Solve for the unknown in the equation below:

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

_____

_____

_____

_____

_____   (3)

7.4   You decided to buy TWO types of chocolates to sell at your school's entrepreneurs day. The one type of chocolate costs **R8** and the other type costs **R6**. You spent **R150** in total on **22** chocolates.

How many of each type of chocolate did you buy?

_____

_____

_____

_____

_____

_____

_____

_____
(5)

[13]

TOTAL: 75

END