GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

# PROVINCIAL EXAMINATION

# JUNE 2024

# GRADE 9

## MATHEMATICS
## (PAPER 1)

**TIME: 1½ hours**

**MARKS: 75**

**12 Pages**

**NAME OF LEARNER:** _____ **CLASS:** _____

**NAME OF SCHOOL:** _____

**P.T.O.**

**INSTRUCTIONS AND INFORMATION**

1. This question paper consists of 7 questions.
2. Answer ALL the 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 stated otherwise.
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 this 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 of the options below contains rational numbers only?

A $\frac{1}{4}$ ; $\sqrt{\frac{4}{0}}$ ; $\frac{22}{7}$

B –2,5401 ; $\sqrt{89}$ ; 4,3891016

C $\sqrt{-100}$ ; 0,25 ; 4

D –8 ; $-\sqrt{144}$ ; $5\frac{7}{8}$ (1)

1.2 To simplify $(100p^a)^b$ …

A add the exponents.
B subtract the exponents.
C multiply the exponents.
D divide the exponents. (1)

1.3 Evaluate: $\frac{4}{5}x-\frac{1}{3}x-\frac{1}{15}x$

A $\frac{2}{15}x$

B $\frac{2}{5}x$

C $\frac{7}{15}x$

D $\frac{2}{3}x$ (1)

1.4 Subtract $\frac{3a}{9}$ from $\frac{a}{9}$.

A $-2a$

B $\frac{-2a}{9}$

C $\frac{2a}{9}$

D $2a$ (1)

1.5 Which equation below shows the correct use of the commutative property?

A $a+b=b+a$

B $a+(b+c)=(a+b)+c$

C $ab-ac=a(b-c)$

D $a+b+c=abc$ (1)

**[5]**

**SECTION B**

**QUESTION 2**

2.1 Consider the following:

| Number | Prime Factors |
|---|---|
| 63 | $3^2 \times 7$ |
| 252 | $2^2 \times 3^2 \times 7$ |
| 378 | $2 \times 3^3 \times 7$ |

2.1.1 Write down the HCF of 63 and 378.

_____ (1)

2.1.2 Write down the LCM of 252 and 378.

_____ (1)

2.2 Vusi and Themba each bought a pair of jeans from two different shops.

The selling price of the pairs of jeans was R599,99 in both shops. Both shops offered a discount on the selling price as given below:

Vusi bought his for 20% less than the selling price and Themba only paid $\frac{3}{4}$ of the selling price.

Who paid less for his pair of jeans? Support your answer by showing all the calculations.

_____

_____

_____

_____ (3)

2.3 A young couple left the house and drove toward the north at an average speed of 80 km/h.

Their uncle left the same house sometime later, driving in the same direction at an average speed of 88 km/h.

How long did the young couple drive before their uncle caught up with them?

(3)

2.4 Samuel borrowed a certain amount of money at 11,5% per annum compounded annually over a period of 6 years. The total amount that he paid at the end of the 6 years was R670 000.

How much did he initially borrow?

Round your answer off to the nearest 10.

(4)
**[12]**

**QUESTION 3**

3.1 Choose the correct word within the brackets to complete the sentence.

The quotient of two numbers with different signs is always (positive; negative).

(1)

3.2 Fill in < ; > ; =

$-(2)^2$ $\square$ $-4$ (1)

3.3 Simplify:

$-1^{2022} + (-1)^{2024}$

(2)

3.4 Calculate the following without using a calculator. Leave answers in the simplest form.

3.4.1 $2 - 4^3 + (-12) + \sqrt{144}$

(2)

3.4.2 $\dfrac{\left(-\sqrt{25}\right)^3 \times \left(\sqrt[3]{-8}\right)^2}{-3(-3)^2 + 2 \times 2 + 3}$

(4)

**[10]**

**QUESTION 4**

4.1 Match COLUMN A with the correct answer in COLUMN B. Write only the letter of the correct answer in the ANSWER COLUMN.

| COLUMN A | COLUMN B | ANSWER |
|---|---|---|
| 4.1.1 $3p \times 3p$ | A $3^2 p^{-2}$ | 4.1.1 _____ |
| 4.1.2 $\frac{3}{p} \times \frac{3}{p}$ | B $\left(p^{-2}\right)^4$ | 4.1.2 _____ |
| 4.1.3 $\frac{1}{p^{-2}} \times \frac{1}{p^{-2}} \times \frac{1}{p^{-2}} \times \frac{1}{p^{-2}}$ | C $3^2 p^2$ | 4.1.3 _____ |
| | D $\left(p^2\right)^4$ | |
| | E $\left(p^8\right)^4$ | |

(3)

4.2 Prove the following:

$pq = \frac{q}{p^{-1}}$

(2)

4.3 Simplify:

4.3.1 $\frac{r^{-2} s^{-5} \times r^4 s^{-2}}{r^2 s^6}$

(3)

4.3.2 $\frac{5p^0p+(5q)^0p}{-(2p)^2}$

(3)
**[11]**

**QUESTION 5**

5.1 $T_n = 4n + 3$ is the $n^{th}$ term of a number pattern.

Determine:

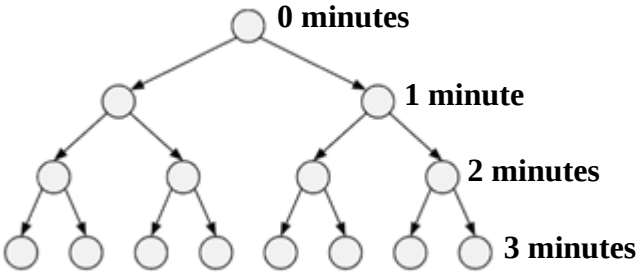
5.1.1 The first two terms of the sequence.

(2)

5.1.2 Which term is equal to 867?

(2)

5.2 Winter is when most flu viruses spread and multiply quickly. The way in which the virus multiplies can be represented by the following sketch:




5.2.1 Complete the table below to show how the virus multiplies.

| **Minute/Minutes** | **0** | **1** | **2** | **3** | **4** | **5** |
|---|---|---|---|---|---|---|
| **Number of viruses** | 1 | 2 | 4 | 8 | | |

(2)

5.2.2 Describe the pattern above in words.

_____

_____ (1)

**[7]**

**QUESTION 6**

6.1 Given: $108x^3y + 75xy + 35x^4y - 18$

6.1.1 How many terms are there in the expression above?

_____ (1)

6.1.2 What is the coefficient of $x$?

_____ (1)

6.1.3 What is the degree of the expression in $x$?

_____ (1)

6.2 Given the expression $-a + (2b - 2a)^3$, determine the value of the expression; if $a = -1$ *and* $b = 2$.

(2)

6.3 Simplify:

6.3.1 $-3a(a + b)(2a - b^2)$

(3)

6.3.2 $(2x^2)^3 + \sqrt[3]{27x^{12}} - 8x^4$

(3)

6.4 Factorise:

6.4.1 $p^2 - 25$

(2)

6.4.2 $3x^2 - 21x + 30$

(3)

**[16]**

**QUESTION 7**

7.1 Write the following statement algebraically.

The sum of three numbers is 123. The second number is five times the first number and the third number is two more than the second number.

(1)

7.2 Solve for the unknown in the equations below.

7.2.1 $4a - 3a(a - 2) + 3a^2 = 10$

(3)

7.2.2 $\frac{2x-3}{2} = \frac{5x}{3}$

(3)

7.2.3 $3^{x-2} = 81$

(2)

7.3 Ryan buys twice as many 5 ℓ bottles of dishwashing liquid than fabric softener.

He paid R120 per 5 ℓ bottle of fabric softener; R150 per 5 ℓ bottle of dishwashing liquid and the total paid was R2 520.

How many 5 ℓ bottles of dishwashing liquid did he buy?

(5)

**[14]**

**TOTAL: 75**

**END**