



GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

PROVINCIAL EXAMINATION
NOVEMBER 2022
GRADE 9

MATHEMATICS
(PAPER 1)

TIME: 1½ hours

MARKS: 75

12 pages

NAME OF LEARNER: _____

GRADE/CLASS: _____

P.T.O.

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. This question paper consists of 8 questions.
2. Answer ALL the questions.
3. A non-programmable calculator may be used unless otherwise stated.
4. 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 8 in Section B in the spaces provided on this question paper.
9. Write neatly and legibly.

SECTION A

QUESTION 1

Answer the following questions by circling the letter next to the correct answer.

- 1.1 How many terms are in the expression: $-(3x - 1)^3 + x - x^4 \div x^2$?
- A 2
 - B 3
 - C 4
 - D 5
- (1)

- 1.2 Which of the following is **not** an example of a **rational** number?
- A 5
 - B $\sqrt{5}$
 - C 2,5
 - D $\sqrt{\frac{1}{25}}$
- (1)

- 1.3 Choose a statement that describes how to determine the next term in the pattern: $1 ; \frac{1}{2} ; \frac{1}{4} ; \frac{1}{8} ; \frac{1}{16}$.
- A Add 2
 - B Add $\frac{1}{2}$
 - C Multiply by 2
 - D Multiply by $\frac{1}{2}$
- (1)

1.4 Complete: $\sqrt{13^2 - 5^2} = \dots$

- A 8
- B $\sqrt{8}$
- C 12
- D $\sqrt{16}$

(1)

1.5 Given the table:

x	-2	-1	0	1
y	-9	-4	1	6

Identify the formula that shows the relationship between x and y in the table given above.

- A $y = x + 6$
- B $y = -x - 4$
- C $y = -2x - 9$
- D $y = 5x + 1$

(1)

[5]

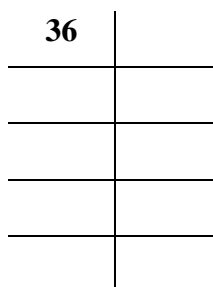
SECTION B

QUESTION 2

2.1 Write 21 : 35 in its simplest form.

_____ (2)

2.2 2.2.1 Use the ladder method to determine the prime factors of 36. Write your answer in exponential form.



36 = _____

(3)

2.2.2 The number 540 as product of its prime factors is $= 2^2 \times 3^3 \times 5$.

Determine the LCM and HCF of 36 and 540, using the information given above, as well as your answer to QUESTION 2.2.1.

 _____ (2)

2.3 12 contractors can build an RDP house in 7 days. How many contractors, working at the same rate, will be needed to build the house in 4 days?

 _____ (3)

[10]

QUESTION 3

3.1 Arrange in ascending order.

25; -62; -55; 0; -43; 8

(1)

3.2 Evaluate without the use of a calculator.

$$\frac{\sqrt{49} - 2}{3 + (-2)^3} \times 5$$

(4)

[5]

QUESTION 4

4.1 Complete the exponential law by filling in the missing part.

$$\underline{\hspace{2cm}} = \frac{1}{a^m}$$

(1)

4.2 Simplify fully:

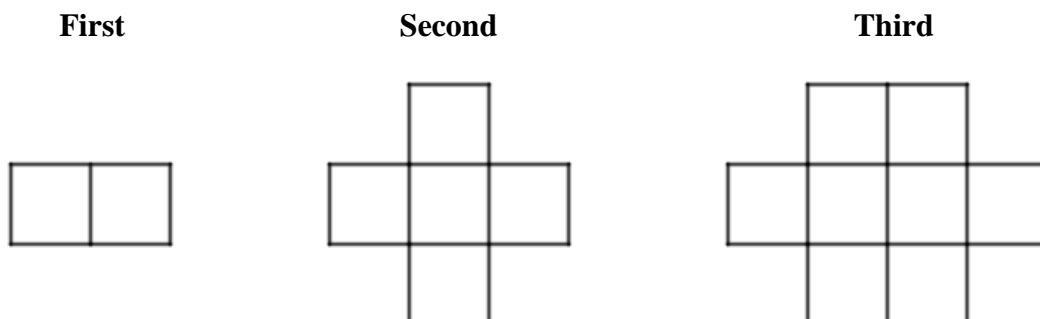
$$\frac{p^{4x+4} \cdot p^{(-2x-2)}}{(p^2)^{x+1}}$$

(5)

[6]

QUESTION 5

5.1 A friend created a pattern using squares. In the 1st arrangement she used 2 squares, in the 2nd she used 5 squares and in the 3rd she used 8 squares, as shown below:



5.1.1 Study the pattern carefully and extend it by drawing a sketch showing how the squares will be arranged in the sixth pattern.

(2)

5.1.2 Use the table below to determine an algebraic formula ($T_n = \text{_____}$) relating the number of squares to the pattern number.

Pattern Number (n)	1	2	3
Number of Squares (T_n)	2	5	8

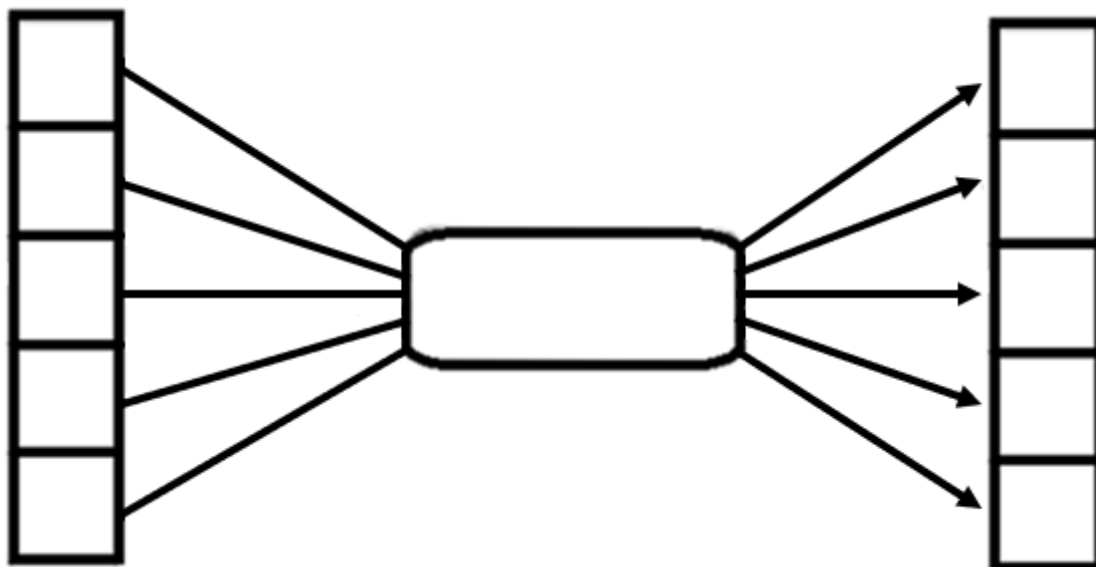
(2)

5.1.3 Use the formula in QUESTION 5.1.2 to determine the pattern number if there are 101 squares.

(2)

5.2 Given: $y = 8x - 3$ and $x \in \{-2; -1; 0; 1; 2\}$.

Fill in the input values and the rule in the flow diagram below. Hence, determine the corresponding output values.



(5)

[11]

QUESTION 6

6.1 Given the expression: $2x^3y + 3xy^3 + 5x^2$.

6.1.1 What is the coefficient of x in the expression?

_____ (1)

6.1.2 Write the expression in descending powers of x .

_____ (1)

6.2 Simplify fully:

6.2.1 $(x + y)^2$

 _____ (3)

6.2.2 $\frac{x^3 + x^2 - 2x}{x^2 - 1}$

 _____ (6)

[11]

QUESTION 7

7.1 Identify the values representing the gradient and the y -intercept from the equation $y = 2x - 5$.

Gradient: _____

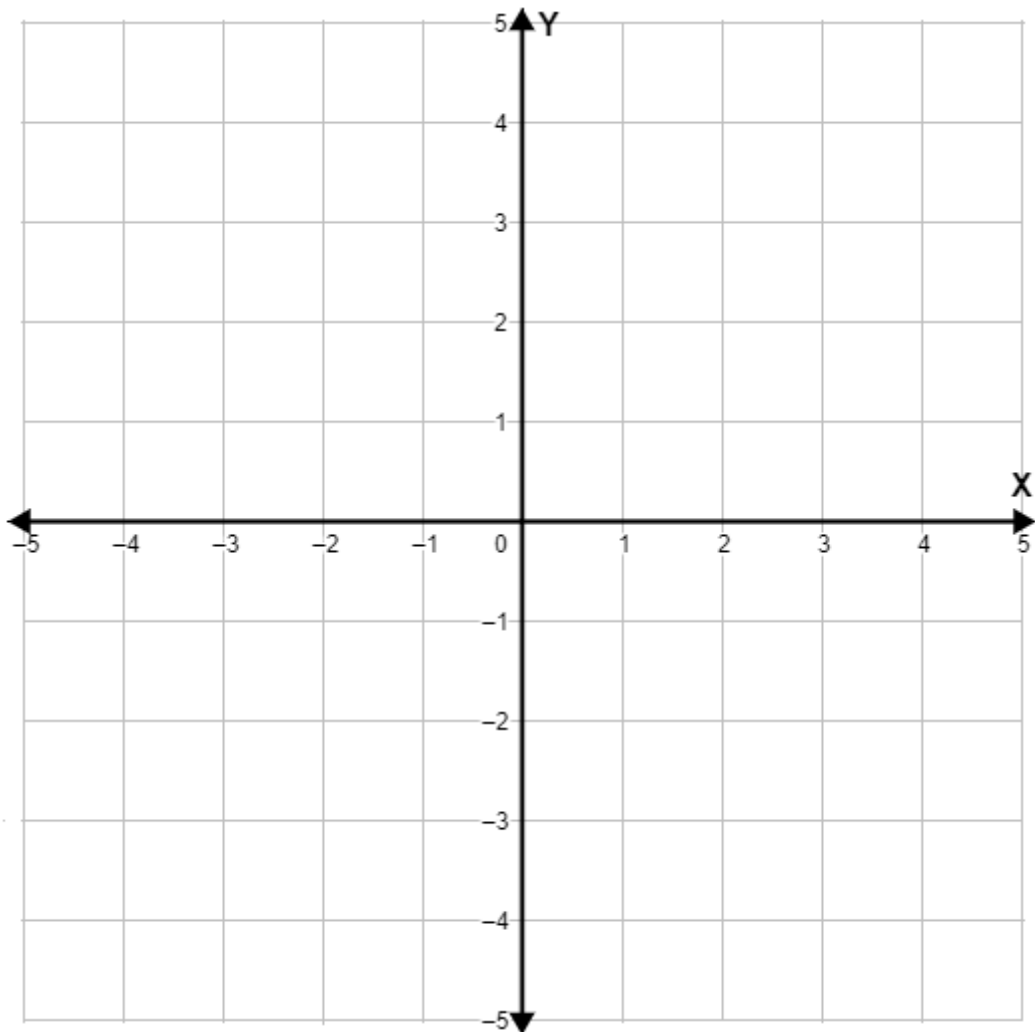
y -intercept: _____ (2)

7.2 Given: $3y + 2x = -6$

7.2.1 Calculate the x -intercept.

 _____ (2)

7.2.2 Sketch the graph of $3y + 2x = -6$ on the set of axes provided below.



(3)

7.3 Three points $A(-\frac{2}{3}; 1)$; $B(-2; \frac{1}{2})$ and $C(0; 3)$, are points on a straight line graph. Use the points to determine the equation of the line.

(4)

[11]

QUESTION 8

8.1 Given: $5^a = 5^2$

What is the value of a ?

(1)

8.2 Solve for y :

8.2.1 $\frac{-8}{y} + 2y = -6 ; y \neq 0$

(6)

8.2.2 $\frac{4y+3}{5} = 5y-12$

(4)

8.3 When the object $s \blacksquare t$ is inserted into a computer programme, the programme reads it as $t^2 + st$. If the programme is given $4 \blacksquare x = -3$, then what will the value(s) of x be? (Assuming that the format of the programme remains the same.)

(5)

[16]

TOTAL: 75