GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

PROVINCIAL EXAMINATION

JUNE 2022

GRADE 9

MATHEMATICS

TIME: 1½ hours

MARKS: 75

11 pages

NAME OF LEARNER: _____

GRADE: _____

EXEMPLAR

P.T.O.

INSTRUCTIONS AND INFORMATION

1. This question paper consists of 7 questions.
2. Answer ALL questions.
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 this question paper.
9. Write neatly and legibly.

EXEMPLAR

SECTION A

QUESTION 1

Answer the following questions by choosing the correct answer. Circle the letter next to the correct answer.

1.1 Complete: $(2x + y)^0$

A $2x + y$
B $x + y$
C 1
D 0

(1)

1.2 Written below are two statements about a number pattern:

- The first term of a sequence is 8.
- The constant difference of the sequence is 2.

Which of the following sequences agrees with the above statements?

A 8; 6; 4; 2; ...
B 8; 4; 2; 1; ...
C 8; 16; 32; 64; ...
D 8; 10; 12; 14; ...

(1)

1.3 Given the expression: $m^3 + 3m^2 + 5m + 2$, the coefficient of m is …

A 1
B 2
C 3
D 5

(1)

EXEMPLAR

1.4 Determine the value of $3 - (-5 + 2) + 3$.

A 13
B 9
C 7
D 3 (1)

1.5 For which value of t is $\frac{t}{2t-2}$ undefined?

A 1
B 2
C -1
D -2 (1)

[5]

EXEMPLAR

SECTION B

QUESTION 2

2.1 The following table shows multiples and factors of 30, 75 and 100.

Factors	Number	Multiples
1, 2, 3, 5, 6, 10, 15, 30	**30**	30, 60, 90, 120, 150, 180, 210, 240, 270, 300…
1, 3, 5, 15, 25, 75	**75**	75, 150, 225, 300, 375, 450, 525, 600, 675, 750…
1, 2, 4, 5, 10, 20, 25, 50, 100	**100**	100, 200, 300, 400, 500, 600, 700, 800, 900, 1 000 …

2.1.1 Write down the HCF of 30 and 75.

_____ (1)

2.1.2 Write down the LCM of 75 and 100.

_____ (1)

2.2 The $\sqrt[3]{15}$ is between which two consecutive whole numbers?

_____ (2)

2.3 Is the $\sqrt[3]{15}$ rational or irrational?

_____ (1)

EXEMPLAR

2.4 Determine which ONE of the four tables given below represents direct proportion. Justify your answer.

Table A

x	4	8	12	16
y	5	15	20	25

Table B

x	30	50	100	120
y	$6\frac{2}{3}$	4	2	$1\frac{2}{3}$

Table C

x	3	5	8	12
y	12	20	32	48

Table D

x	1	2	3	4
y	10	7	5	2

(3)

2.5 It takes Sandile 6 hours to fill 1 tank with water, working alone.
Jacob needs 12 hours to fill the same tank with water, working alone.
If Sandile and Jacob work together to fill the tank, how long would it take? Give your answer in hours.

(4)
[12]

EXEMPLAR

QUESTION 3

3.1 Which type of numbers in the number system are defined by the following?

"Numbers that extend the natural and whole number systems by including the operation $a - b$, where $a < b$."

(1)

3.2 The following statements are incorrect.
Write down the correct version of each statement.

No.	Incorrect Statement	Correct Statement
3.2.1	$\sqrt[3]{-64} = -8$	
3.2.2	$-4 - (-6) = -10$	
3.2.3	$\sqrt{-9} = \pm 3$	
3.2.4	$(-5)^2 = -25$	

(4)

3.3 Calculate the following.

3.3.1 $(5)(-2)^2 - 15 \div 3$

(3)

3.3.2 $\dfrac{2 - (-4) - 2(1 - 4)}{1 - 4}$

(3)

[11]

EXEMPLAR

QUESTION 4

4.1 The exponential form of 25 is written as 5^2. What does the exponent tell us?

(1)

4.2 Represent the following statement in exponential form:

"7 to the fifth power".

(1)

4.3 Rewrite the following expressions with positive exponents.
Leave your answer in the simplest exponential form.

4.3.1 $3x^{-2}$

(1)

4.3.2 $\frac{2}{5^{-2}}$

(1)

4.4 Simplify the following fully:

4.4.1 $\frac{(-5wz)^2(-2w^2z)}{50w^{-1}z}$

(4)

4.4.2 $\frac{81^{x+1}.5^{2x-2}}{3^{4x}.25^x}$

(5)

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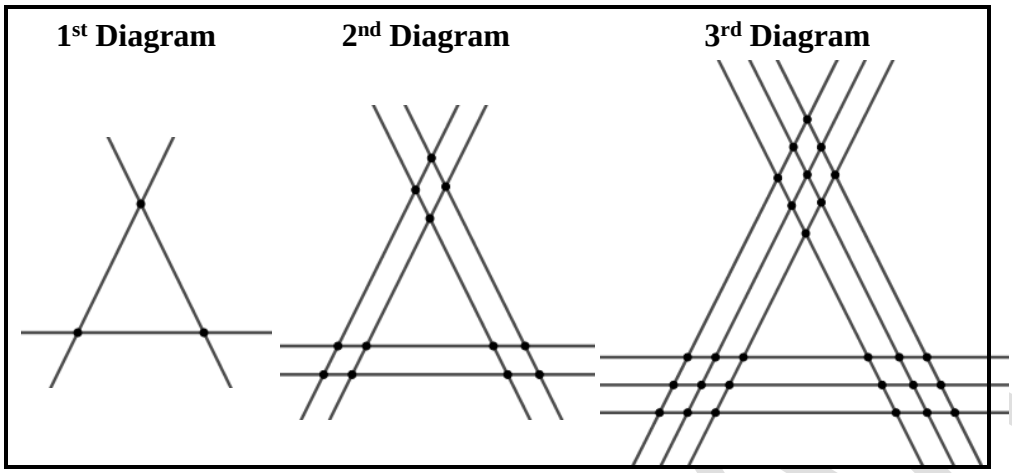
EXEMPLAR

QUESTION 5

5.1 Examine the first three diagrams in the sequence of diagrams given below.



5.1.1 Complete the table by determining the number of points of intersection in the next two diagrams.

Position of diagram	**1**	**2**	**3**	**4**	**5**
Number of points of intersection	**3**	**12**	**27**		

(2)

5.1.2 Describe the relationship between the position of the diagram and the number of points in each intersection in your own words.

(2)

5.2 Numbers are arranged in the following pattern. If the pattern is extended, what will be the fifth number in the 100th row?

Row 1	21	22	23	24	25	26
Row 2	27	28	29	30	31	32
Row 3	33	34	35	36	37	38

(3)
[7]

EXEMPLAR

QUESTION 6

6.1 What is an algebraic expression containing two terms called? (1)

6.2 What are x and y in the expression $2y^4 - 3x^2y^2 + 5x^3$ referred to as? (1)

6.3 Simplify the following fully:

6.3.1 $\sqrt{9x^4y^2}$ (1)

6.3.2 $(x + 5)(x - 3)$ (3)

6.3.3 $\dfrac{25z^2 - 9}{5z + 3}$ (3)

6.4 Factorise fully:

6.4.1 $3x(q - r) - 2(q - r)$ (1)

6.4.2 $2x^3 - 10x^2 - 28x$ (3)

[13]

EXEMPLAR

QUESTION 7

7.1 Describe $3(x-5)=16$, in words.

(1)

7.2 Translate the following statement into a mathematical equation.

The sum of half a number and 4 are doubled, thereafter decreased by 1 to give an answer of 13.

(1)

7.3 Solve for x:

7.3.1 $0{,}3x-2{,}1=0{,}7-0{,}4x$

(2)

7.3.2 $9^{x+1}=\frac{1}{27}$

(3)

7.3.3 $\frac{5x-7}{3}-\frac{7x-10}{5}=1$

(3)

7.4 The square of a number added to twice the number equals three.
Determine the possible values of the number.

(4)

[14]

TOTAL: 75

END

EXEMPLAR