



LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF
EDUCATION

GRADE 09

MATHEMATICS
NOVEMBER 2021
TEST

DUE DATE: NOVEMBER 2021

MARKS : 100

This question paper consists of 7 pages including the cover page.....

INSTRUCTIONS AND INFORMATION

1. Write your name and class (for example grade 09^A) on your answer book.
2. This question paper consists of 2 SECTIONS.
 - **SECTION A** consist of THREE questions.
 - **SECTION B** consist of FOUR questions Answer ALL sections .
3. Number answers correctly according to the numbering system used in this question paper.
4. You may use a non-programable calculator.
5. The diagrams are not drawn to scale.
6. It is in your best interest to write neatly and legibly.

SECTION A

- **QUESTION 1 [Whole numbers, integers]**
- **QUESTION 2 [EXPONENTS]**
- **QUESTION 3 [Patterns, functions and relationships]**

QUESTION 1

- 1.1 Sarah and Mpho have received a total of 15 000 **masks** to distribute in their community. The amount is divided into a ratio of **3:2** respectively. Find how many they will each have for distribution. (3)

- 1.2 Given the list of numbers : 0,42 ; π ; 36 ; 2 ; -48 ; $\sqrt{35}$ Write down the following :

1.2.1 Rational number (2)

1.2.2 Integers (2)

1.2.3 Multiple of 6 (1)

1.2.4 Prime number (1)

1.2.5 Irrational Numbers (2)

1.3

Find the **HCF** of the following numbers using prime factorisation (*tree diagram*) (3)

1.3.1 32 AND 80

Find the **LCM** of the following numbers by listing their multiples. (2)

1.3.1 4, 6 AND 8

[16]

QUESTION 2

- 3.1 Simplify the following using **laws of exponents**:

$$a^3 \times a^{-1} \div a^2 \quad (2)$$

$$(x^3y)^4 \times 2x^3 \quad (3)$$

$$\sqrt{25a^4c^8} \quad (3)$$

- 3.2 Find the value of x : (3)
 $3^{x+2} = 27$

[11]

QUESTION 3

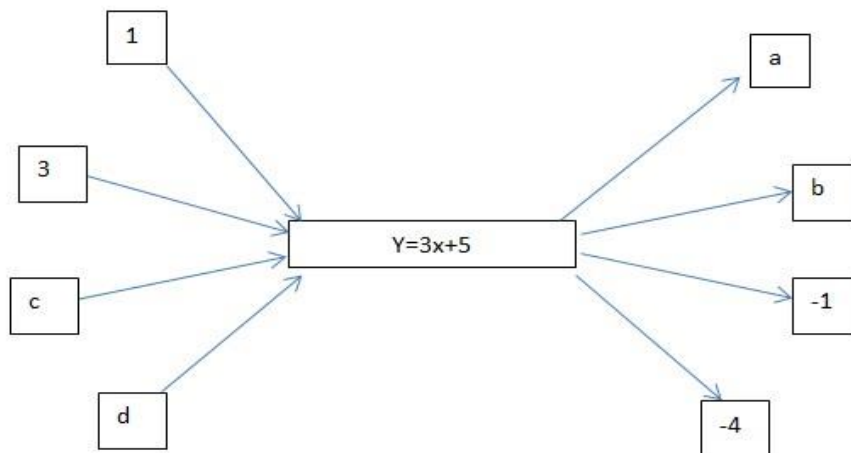
3.1 Consider the sequence **6;11;16; 21;.....**

3.1.1 Write down the next two terms. (2)

3.1.2 Determine the general rule (n th term). (3)

3.1.3 Calculate the 15th term. (2)

3.2 Determine the values of ***a, b, c, and d.*** (4)



3.3 Given the table:

Position in the sequence	1	2	3	4	5	g	T_n
Term	1	8	15	e	f	57

3.3.1. Determine the values of ***e, f and g*** (3)

3.3.1 Determine the general rule of the pattern in the form, $T_n =$ (2)

[18]

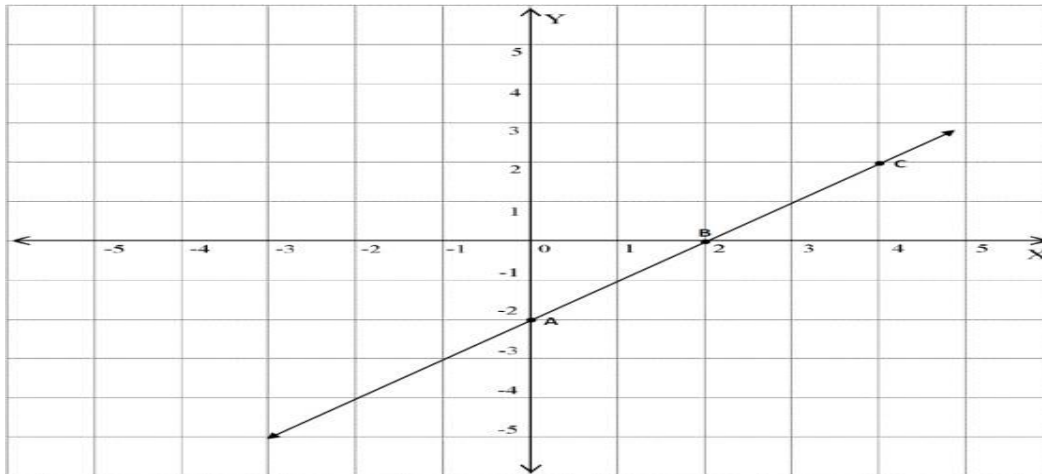
TOTAL SECTION A [45]

SECTION B [55]

- **QUESTION 4 [Graphs and transformation]**
- **QUESTION 5 [ALGEBRAIC EXPRESSIONS]**
- **QUESTION 6 [ALGEBRAIC EQUATIONS]**
- **QUESTION 7 [Geometry of straight lines and Geometry of 2D]**

QUESTION 4

4.1 Write down the coordinates of the following points. (3)



4.2 Given: $y = 4x - 3$ complete the table below and on the same set of axes plot the graphs (USING THE GRAPH SHEET). (6)

x	-3	-2	-1	0	1	2	3
$y = 4x - 3$							

[9]

QUESTION 5

5.1 GIVEN: $14p^4 - 2p^3 + 8p - 6$

5.1.1 How many terms does the expression have? (1)

5.1.2 Calculate the value of the expression if $p = 1$ (2)

5.2 Simplify: (3)

$$12xc + 3c + 10c - 4ax - x^2 + 2xc + 11xa + 8x^2$$

5.3 Expand each of these expressions:

5.3.1 $(a + b)(a + b)$ (2)

5.3.1 $(2a - 3b)(2a - 3b)$ (2)

5.4 Divide the following :

$$5.4.1 \quad \frac{18x^2 + 4x}{2x} \quad (2)$$

$$5.4.2 \quad \frac{3x(5x + 4) + 6x(5x + 3)}{5x} \quad (3)$$

[15]

QUESTION 6

6.1 If $\frac{a+3}{b} = \frac{5}{6}$; Determine b when $a = 5$ (3)

6.2 Solve the following equations:

6.2.1 $3y + 22 = 15$ (2)

6.2.2 $x^2 + 5x - 4 = 0$ (3)

6.3 Ben and Thabo decide to do some calculations with a certain number. Ben multiplies the number by 5 and adds 12. Thabo gets the same answer as Ben when he multiplies the number by 9 and subtracts 16. What is the number they worked with? (3)

[11]

QUESTION 7

7.1 The following box has possible answers to complete the sentences below.

Square, Scalene, 45° , Parallelogram, 60° , kite, Revolution, Isosceles, 90° , Compliment.

1.1.1 A triangle with no equal sides is called a _____ (1)

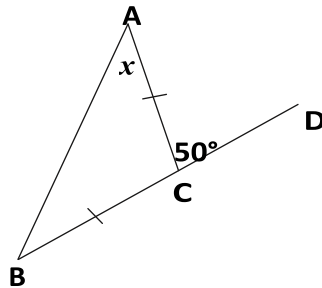
1.1.2 In a right-angled isosceles triangle the sizes of the angles are _____, _____ and _____ (3)

1.1.3 60° is the _____ of 30° (1)

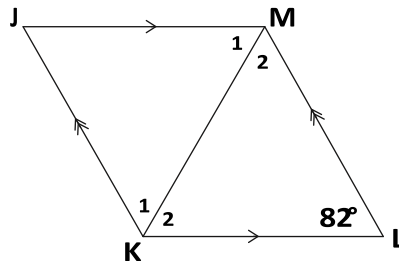
1.1.4 Each interior angle of an equilateral triangle is _____ (1)

- 7.2 BCD is a straight-line segment. (3)

Find the size of x .



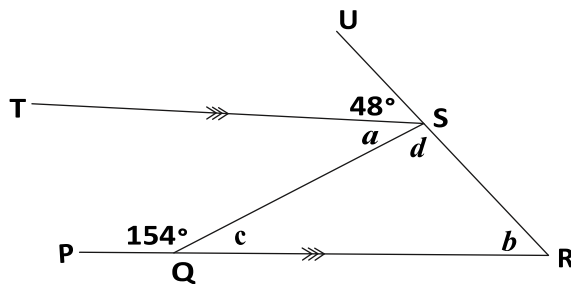
- 7.3 JKLM is a rhombus. Calculate with reasons the sizes of the following angles:



- 7.3.1 $\angle KJM$ (2)

- 7.3.2 $\angle M_2$ (3)

- 7.4 Calculate the sizes of a, b, c and d



(6)

[20]

TOTAL SECTION B [55]

TOTAL MARK [100]

“mathematics is the cheapest science. Unlike physics or chemistry, it does not require an expensive equipment. All one needs for mathematics is a pencil and paper” – George Polya.