LIMPOPO

PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF
EDUCATION

CAPRICORN SOUTH DISTRICT

MATHEMATICS

INVESTIGATION

GRADE 10

DATE: 30 January 2020   **TOTAL MARKS: 50**

School: ……………………………………………………………………

Learner's Name: ……………………………………………………………. Class …..

INSTRUCTIONS AND INFORMATION:

Read the following instructions carefully before answering the questions.

1. **The question paper consists of THREE Activities**

2. **Answer ALL Activities in the spaces provided.**

3. **Clearly show ALL working steps used when determining your answers.**

4. **You may use a non – programmable, non – graphical scientific calculator.**

5. **Write neatly and legibly.**

ACTIVITY 1 [12]

Polynomials are named by the highest exponent of the variable as well as the number of terms. For example, $x^5 - 3x^2 - 1$ is a **quintic trinomial**. Quintic is for the exponent 5, which is the highest, while trinomial implies three term. Using the above example, name the following polynomial expressions:

1.1 $4x^2 + x - 3$ _____

1.2 $\frac{3}{5}v^2(3v^2 - 9)$ _____

1.3 $k - 6k + 12k^2 - 3k^5$ _____

1.4 -8 _____

1.5 $36m^6 - 9n^2$ _____

1.6 $5 - 9y$ _____

ACTIVITY 2 [19]

Mr Duma recently inherited a rectangular plot, part of the estate left by his late father. The plot with the following dimensions: Length $= 2x + 1$; Width $= x - 1$.

He has plans to do the following projects on the plot:

- Project A: Purchase fencing material to enclose three sides of the plot as follows: SP, PQ and QR.
- Project B: Build a fancy wall on the front side, SR.
- Project C: Construct paving for a third of the plot.

2.1 Determine the formulae that will be suitable for each of the projects mentioned above. For each formula, also give the reason for your choice. Write down the information in the table attached.

Project	Formulae	Reason
A		
B		
C		

(9)

2.2 Determine the formula, in terms of *x*, that best describes the area of the plot.

_____

_____

_____

(2)

2.3   Suppose x represents the unit of calculating the resale value of the plot in millions of rands. Which of the following values of x gives the best value of the plot? Substantiate your answer with appropriate calculations.

   ♦ $x = 2$
   ♦ $x = 5$
   ♦ $x = -3$

_____
_____
_____
_____
_____
_____

(6)

Conclusion:

_____
_____

(2)

ACTIVITY 3 [19]

Grade 10 learners were given TEN expressions to Factorise fully. Zanadu submitted her work, with THREE of the solutions being algebraically correct and the rest are incorrect.

1.   Identify and CIRCLE the LETTER that represent solutions with correct answers.   (3)

2.   From the SEVEN incorrect solutions, identify and underline the mistakes made in EACH. (7)

3.   Correct the mistakes made in EACH incorrect solution.   (9)

	Possible solutions	Corrected solutions if identified to be incorrect.
Example	$6px - 12px = \underline{6p}(x - 2x)$	$6px^2 - 12px = 6px(x - 2)$
A	$5a^2 - 25b^2$ $= 5(a^2 - 5b^2)$ $= 5(a - 5b)(a + b)^1$	
B	$x - 4$ $= (\sqrt{x} - 2)(\sqrt{x} + 2)$	
C	$c^2 + d^2$ $= (c + d)(c - d)$	
D	$\dfrac{e^2}{25} - \dfrac{f^2}{36}$ $= 36e^2 - 25f^2$	

	$= (6e - 5f)(6e + 5f)$	
E	$2a^2b - ab - a$ $= ab(2a - 1) - a$	
F	$g^2 - 5g - 6$ $= (g - 3)(g - 2)$	
G	$\dfrac{(x-1)^2}{(1-x)^2} = 1$	
H	$2a^2b - ab - a$ $= ab(2a - 1) - a$	
I	$(5y + 1)^2 - 4(y - 1)^2$ $= [5y + 1 - 4(y - 1)][5y + 1 + (y + 1)] \quad = (5y + 1 - 4y + 4)(5y + 1 + 4y + 4)$ $= (y + 5)(9y + 5)$	
J	$(x - 1)^{-1} \times (1 - x^2)$ $= \dfrac{(1-x)(1+x)}{x-1}$ $= -(1 + x)$ $= -x - 1$	

TOTAL: 50

 Please turn over