LG 5 Ver B

Name: _____ Student #:_____

Date:_____ T.A. #:_____

Mathematics 12 Pre-Calculus
LEARNING GUIDE 5 QUIZ – POLYNOMIAL FUNCTIONS

*NO GRAPHING CALCULATORS PERMITTED

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***Full marks will NOT be given for the final answer only.**

When using a calculator, you should provide a decimal answer that is correct **to at least two decimal places** (unless otherwise indicated). Such rounding should occur **only** in the final step of the solution.

1. Write an example of a polynomial function. Explain why it is a polynomial function. (2 marks)

2. For the polynomial function $f(x) = 7x^2 + 11 - 8x$ state: (2 marks)

   a) The degree:

   b) Name of the polynomial function:

   c) Leading coefficient:

   d) Constant term:

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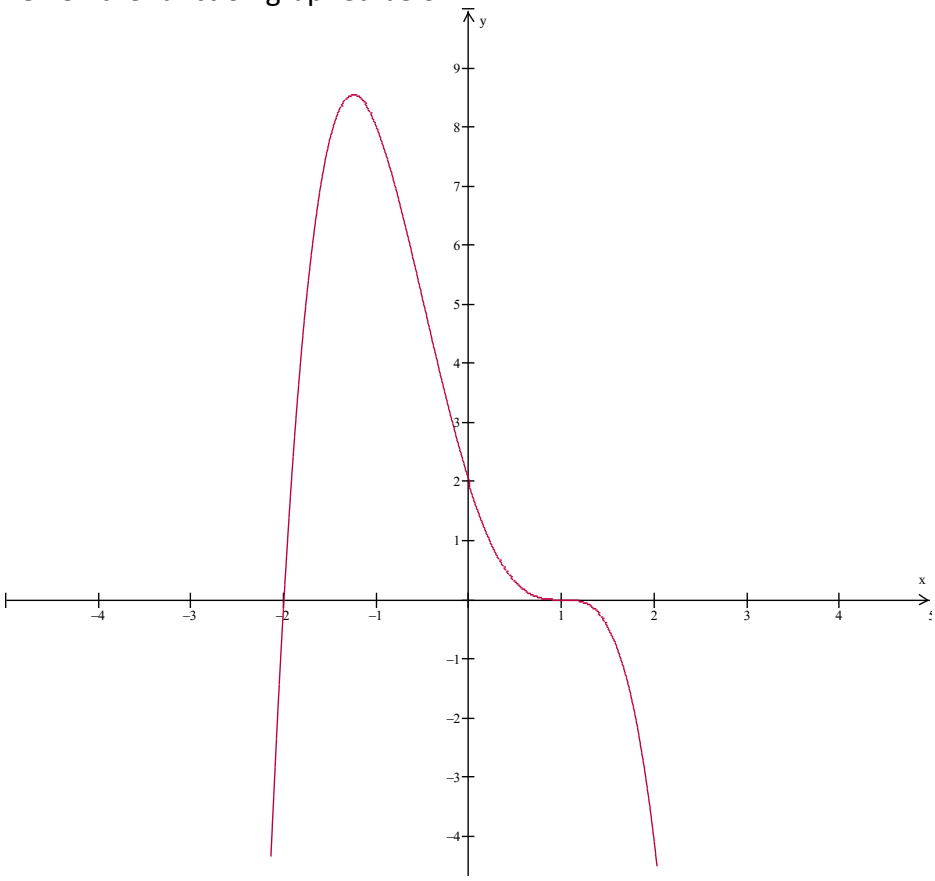
3. Given the function $y = ax^n + 2x + b$, what are the conditions on *a, n,* and *b* for this function to have a range of all real numbers where the curve extends from up into quadrant 2 and down into quadrant 4 and has a positive *y* intercept? (3 marks)

4. Given the function graphed below:



a) What degree is this function? (1 mark)

b) Is the leading coefficient positive or negative? (1 mark)

c) How many different roots does this function have? (1 mark)

d) The equation of the polynomial function. (2 marks)

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5. Given the function $f(x) = x^3 + 3x^2 - x - 3$ (4 marks)

a) Degree and end- behavior:

b) The zeros and their multiplicity:

c) The y-intercept:

6. Determine the quotient: (3 marks)

$$(2x^3 + x^2 - 2x + 1) \div (x + 2)$$

7. Use the remainder theorem to determine the remainder when $-x^2 + 2x + 1$ is divided by $x + 2$. (1 mark)

8. When $x^3 + x^2 + kx - 15$ is divided by $x - 2$, the remainder is 3. Determine k. (2 marks)

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9. For the function $f(x) = x^3 - 13x^2 + 12$

a) List the possible integral factors. (1 mark)

b) Factor fully. (2 marks)

10. Prove that $x^2 + 5x + 6$ is a factor of the polynomial:
$P(x) = x^4 + 5x^3 + 2x^2 - 20x - 24$ (3 marks)

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