Vocabulary: Unit 2: Polynomial Functions

- **Coefficient:**

- **Degree:**

- **End Behavior:**

- **Fundamental Theorem of Algebra:**

- **Geometric Sequence:**

- **Geometric Series:**

- **Multiplicity: Pascal's Triangle:**

- **Polynomial:**

- **Rational Root Theorem:**

- **Relative Minimum:**

- **Relative Maximum:**

- **Remainder Theorem:**

- **Roots:**

- **Sum of a finite geometric series:**

- **Sum of an infinite geometric series:**

- **convergent**

- **divergent**

- **Synthetic Division:**

- **Zero:**

Vocabulary: Unit 2: Polynomial Functions

- **Coefficient:** a number multiplied by a variable.
- **Degree:** the greatest exponent of its variable
- **End Behavior**: the value of f(x) as x approaches positive and negative infinity
- **Fundamental Theorem of Algebra:** every non-zero single-variable polynomial with complex coefficients has exactly as many complex roots as its degree, if each root is counted up to its multiplicity.
- **Geometric Sequence:** is a sequence with a constant ratio between successive terms
- **Geometric Series:** the expression formed by adding the terms of a geometric sequence
- **Multiplicity**: the number of times a root occurs at a given point of a polynomial equation.
- **Pascal's Triangle:** an arrangement of the values of $_nC_r$ in a triangular pattern where each row corresponds to a value of n
- **Polynomial:** a mathematical expression involving a sum of nonnegative integer powers in one or more variables multiplied by coefficients. A polynomial in one variable with constant coefficients can be written in a_2x^2 + form. $a_n x^n + a_{n-1} x^{n-1} + \ldots a_2 x^2 + a_1 a_1 x + a_0$
- **Rational Root Theorem:** a theorem that provides a complete list of all possible rational roots of a polynomial equation. It states that every rational zero of the polynomial equation $f(x) = a_n x^n + a_{n-1} x^{n-1} + \ldots a_2 x^2 + a_1 a_1 x + a_0$,where all coefficients are integers, has the following form: $\frac{p}{q} = \frac{factors\ of\ constant\ term\ a_0}{factors\ of\ leading\ coefficient a_n}$
- **Relative Minimum**: a point on the graph where the function is increasing as you move away from the point in the positive and negative direction along the horizontal axis.
- **Relative Maximum**: a point on the graph where the function is decreasing as you move away from the point in the positive and negative direction along the horizontal axis.
- **Remainder Theorem:** states that the remainder of a polynomial f(x) divided by a linear divisor (x – c) is equal to f(c).
- **Roots**: solutions to polynomial equations.

- **Sum of a finite geometric series**: The sum, S_n , of the first n terms of a geometric sequence is given by $S_n = \frac{a_1 - a_1 r^n}{1-r} = \frac{a_1(1-r^n)}{1-r}$ where a_1 is the first term and r is the common ratio ($r \neq 1$)

- **Sum of an infinite geometric series:** The general formula for the sum S of an infinite geometric series $a_1 + a_2 + a_3 \ldots$ with common ratio r where $|r| < 1$, is $S = \frac{a_1}{1-r}$
- If an infinite geometric series has a sum, i.e. if $|r| < 1$, then the series is called a **convergent** geometric series. All other geometric (and arithmetic) series are **divergent**.
- **Synthetic Division:** Synthetic division is a shortcut method for dividing a polynomial by a linear factor of the form (x – a). It can be used in place of the standard long division algorithm.
- **Zero**: If f(x) is a polynomial function, then the values of x for which f(x) = 0 are called the **zeros** of the function. Graphically, these are the x intercepts.