Vocabulary: Polynomials and Linear Factors

Vocabulary

- Degree – the greatest exponent of all terms of a polynomial.
  - When a polynomial is written in standard form, the degree is the exponent of the first term.
  - For example, the degree of the polynomial $4x^3 – 5x^2 + x – 3$ is three.
- Linear factor – a first-degree factor of a polynomial.
  - For example, the polynomial $x^2 – 2x – 35 = (x + 5)(x – 7)$, so the linear factors of $x^2 – 2x – 35$ are $(x + 5)$ and $(x – 7)$.
- Multiplicity – the number of times the associated factor of a zero occurs in a polynomial.
  - For example, $x^3 + 16x^2 + 64x = x(x + 8)(x + 8)$, so this polynomial has two zeros:
    - $x = 0$ is a zero with multiplicity 1, because x is a factor one time.
    - $x = –8$ is a zero with multiplicity 2, because $(x + 8)$ is a factor twice.
- Polynomial – a monomial or sum of monomials.
  - Each monomial is called a *term* of the polynomial.
    - For example, $2x^3 – 5x^2 + 9x – 4$ is a polynomial with four terms.
- Zero (of a polynomial) – an x-value for which the value of the polynomial is zero.
  - On a graph, each x-intercept represents a zero.
    - For example, the zeros of the polynomial $y = x^3 – x^2 – 2x = x(x + 1)(x – 2)$, shown to the right, are the values where the graph has an x-intercept: $x = –1$, 0, and 2.