

Names: _____

Activity #3: Polynomials 1

College Algebra

1. Fill in the boxes to describe the long-term behavior of the following polynomial.

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

• As $x \rightarrow \infty$, $p(x) \rightarrow$

• As $x \rightarrow -\infty$, $p(x) \rightarrow$

2. Using polynomial long division, find the quotient and remainder when

$$a(x) = x^5 - 3x^4 - x^3 + 11x^2 - 12x + 4$$

is divided by

$$b(x) = x^3 - x^2 - 4x + 4.$$

3. Use synthetic division to find the quotient and remainder when

$$a(x) = x^5 - x^4 - 9x^3 + 5x^2 + 16x - 12$$

is divided by $b(x) = x - 3$.

4. The polynomial

$$p(x) = x^5 - 6x^4 + x^3 + 36x^2 - 20x - 48$$

has roots at $-1; 3; 2; 4$. Completely factor $p(x)$ as a product of linear factors.

5. The polynomial

$$p(x) = x^5 - 9x^4 + 32x^3 - 56x^2 + 48x - 16$$

has roots at 1 and 2. Find the multiplicity of these roots.

6. Construct a polynomial of degree 3 which has roots at -2, -1, and 1.