Names: _____ _____ _____

Activity #6: Polynomials **College Algebra**

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

$$p(x) = -4x^5 + 10x^2 + x - 1$$

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- As $x \to \infty$, $p(x) \to$ $\square$
- As $x \to -\infty$, $p(x) \to$ $\square$

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

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

is divided by

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

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

$$a(x) = x^5 - 6x^4 + 10x^3 - 11x + 6$$

is divided by $b(x) = x - 2$.

4. Compute the following products.

   (a) $(x-1)(x-1)(x+1)$

   (b) $(x-2)(x+3)(2x-1)$

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

6. Construct a polynomial whose roots are 1, -2, and $1/2$.