

Names: \_\_\_\_\_

**Activity #6: Polynomials**

**College Algebra**

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

$$p(x) = 7x^6 + 13x^2 - x + 1$$

• 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

$$a(x) = x^5 - 2x^4 - 6x^3 + 8x^2 + 5x - 6$$

is divided by  $b(x) = x - 1$ .

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 -1.

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