Names: _____ _____ _____

Activity #5: Transformations **College Algebra**

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

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

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

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 $b(x) = x - 1$.

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, 2, and 1.

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