Algebra Worksheet – part of Homework #1 - due Friday, January 19

1. Factor.

(a) $2x^5 + x^4 - 6x^3$ (b) $12x^3y^2 - 3xy^4$

2. Simplify.

(a) $\dfrac{\frac{2}{x} - \frac{1}{x+1}}{\frac{1}{x} + \frac{2}{x+1}}$ (b) $(3^0 - 2^{-3})^{-2}$ (c) $\dfrac{(x^2y^3)^4(xy^4)^3}{(x^3y^2)^0(x^5y)^2}$

3. Expand $(x-2)^3$.

4. Find the least common denominator, and subtract the fractions.

$$\frac{x+2}{x^2(x-1)(x+1)} \quad - \quad \frac{2x+1}{x(x+1)^2}$$

5. Solve:

(a) $x^2 = 9$ (b) $x^2 = x + 2$

(c) $x^2 > 9$ (d) $x^2 \leq x + 2$

6. (a) Use the quadratic formula to solve $x^2 - 6x + 3 = 0$.

(b) Give a factorization (over the real numbers) of $x^2 - 6x + 3$.

7. Let $y = -x^2 + 4x - 3$.

(a) Find the x- and y-intercepts.

(b) Find the x- and y-coordinates of the vertex of the parabola.

(c) Solve the equation $y \geq 0$.

(d) Graph the parabola.