Name:

HW 2: §B.2-(half of)C.2

Complete the following problems to the best of your ability. **SHOW ALL OF YOUR WORK.** Unshown work will not be graded. You may use a calculator.

1. Factor the following expressions completely.

   (a) $3x^2 - 9x$

   $= 3x(x-3)$

   (b) $-x^3 + x$ $= x(1-x^2)$ or $-x(x^2-1)$

   (c) $x^2 + 2x - 15$ $= (x+5)(x-3)$

   (d) $x^3 + 2x^2 - x - 2$ $= x^2(x+2) - 1(x+2)$

   $= (x^2-1)(x+2)$

2. Evaluate and simplify the following expressions.

(a) $\dfrac{x^2-1}{x^2+5x+6} \cdot \dfrac{x+3}{x-1}$ $= \dfrac{(x+1)(x-1)}{(x+3)(x+2)} \cdot \dfrac{(x+3)}{(x-1)}$

$= \dfrac{x+1}{x+2}$

(b) $\dfrac{x^2-4}{x^2+6x+8} \div \dfrac{x+4}{x-2}$ $= \dfrac{(x+2)(x-2)}{(x+4)(x+2)} \cdot \dfrac{(x-2)}{x+4}$

$= \dfrac{x^2-4x+4}{x^2+8x+16}$

(c) $\dfrac{2}{x-3} - \dfrac{3}{x+2}$ $= \dfrac{2(x+2)}{(x-3)(x+2)} - \dfrac{3(x-3)}{(x-3)(x+2)}$

$= \dfrac{2x+4-3x+9}{x^2-x-6}$

$= \dfrac{-x+13}{x^2-x-6}$