SEW Math 090 **Summer 2016**

Worksheet 6.1: Rational Expressions and Functions

1. Simplify each of the following rational expressions.

   (a) $\frac{100x^3y^5}{36xy^8}$

   (b) $\frac{48ab^3c^2}{6a^7bc^0}$

   (c) $\frac{-3m^4n}{12m^4n^3}$

   (d) $\frac{12r^9s^3}{24r^8s^4}$

2. Find the domain of each of the following rational functions. (Remember that dividing by 0 is undefined. Find any value of x that makes the denominator of the function 0; those values of x are *not* in the domain.)

   (a) $f(x) = \frac{1}{x-2}$

   (b) $f(x) = \frac{3x-1}{2x-5}$

   (c) $f(x) = \frac{x}{x^2-4}$

   (d) $f(x) = \frac{x}{x^2-4}$

3. Factor the following polynomials.

   (a) $x^2 - 4$

   (b) $x^2 + 6x + 9$

   (c) $x^2 + x - 6$

   (d) $x^2 + x - 2$

   (e) $x^2 + 2x - 3$

4. Use your answers from Question 3 to simplify the following rational expressions.

   (a) $\frac{(x^2+6x+9)(x^2-4)}{(x^2+x-2)(x^2+x-6)}$

   (b) $\frac{(x^2+x-6)(x^2+2x-3)}{(x^2+x-2)(x^2+6x+9)}$

5. State the domain of each of the following rational functions, and simplify.

   (a) $f(x) = \frac{x-5}{x^2-25}$

   (b) $f(x) = \frac{x(x-3)^5}{x^3(x-3)^2}$

   (c) $f(y) = \frac{y^2+8y-9}{y^2-5y+4}$

   (d) $f(x) = \frac{x+5}{-x-5}$

   (e) $f(y) = \frac{y-14}{14-y}$