Homework: pg 112 #1, 2, 3, 5, 6bde, 7, 8, 10, (14)

**Evaluating and Simplifying Rational Expressions**

Rational Expression – any quantity that can be expressed in the form $\frac{p}{q}$

 where p and q are polynomials and/or integers and

 $q\ne 0$.

Ex; $\frac{4x+7}{3x+2}$, x3 – 125, $\frac{2}{7}$, 5.32, etc,…

The constant π would be a non-example since π = 3.141592… cannot be written in the form $\frac{p}{q}$ with ‘p’ as an integer.

Example 1

Evaluate f(3).

a) $f\left(x\right)=\frac{x^{2}+1}{x+2}$ b) $f\left(x\right)=\frac{-x^{2}+4x+2}{x^{2}+1}$ c) $f\left(x\right)=\frac{x+5}{x-3}$

Notice in example c) that f(3) cannot be evaluated since the denominator is equal to \_\_\_\_\_\_ when x = 3. For $f\left(x\right)=\frac{x+5}{x-3}$ , x cannot be assigned the value 3. This is called a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and so we state that \_\_\_\_\_\_\_\_\_\_\_.

Example 2

State the restrictions for the following rational expressions.

a) $\frac{x-3}{x-2}$ b) $\frac{2x^{2}-5x+2}{x}$ c) $\frac{x^{2}+3}{(2x-5)(x+3)}$

d) $\frac{3x^{2}}{x-y}$ e) $\frac{5x^{2}-y+2}{8}$

Example 3

Simplify and state the restrictions.

a) $\frac{5x+25}{-3x-15}$ b) $\frac{x^{2}-9}{2x-6}$ c) $\frac{2x+5}{x^{2}+5x-14}$

d) $\frac{2m^{2}-18}{m^{2}-6m+9}$ e) $\frac{2x^{2}-7x-15}{8x+12}$ f) $\frac{-8x^{3}y^{4}}{24x^{4}y^{3}}$