6.1 Rational Expressions

A rational expression is an algebraic fraction with a **polynomia** in the numerator and/or denominator.

$$\frac{x^2+2}{3}$$

$$\frac{1}{2x} \qquad \frac{x^2+2}{3} \qquad \frac{x+2}{x^2-3x+1}$$

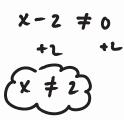
Non-permissible values are any value(s) of the variable that make the denominator equal to Zero

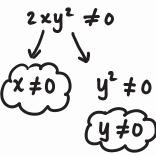
Example 1: Determine the non-permissible values of the following rational expressions:

a)
$$\frac{2x}{x-2}$$

b)
$$\frac{5}{2xy^2}$$

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





Example 2: Simplify the following rational expressions:

$$a) \frac{x+2}{x^2+4x+4}$$

1 Factor numerator & denominator

$$\frac{1(x+2)}{(x+2)(x+2)}$$

(2) state any non-permissible values (n.p.v.)

$$(x+2)(x+2) \neq 0$$

$$x+2 \neq 0$$

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$$\frac{1}{x+2}$$

$$x^{2} - 3x + 2 \neq 0$$
 Factor

 $-\frac{1}{2} \times -\frac{1}{2} = 2$ First!

 $-\frac{1}{2} + -\frac{1}{2} = -3$
 $(x-1)(x-2) \neq 0$
 $x-1 \neq 0$ $x-2 \neq 0$
 $x \neq 1$

(3) cancel common factors

(4) Write final answer Pre-Calc 11

