

**Integrated Math 3. 10.1 Simplifying Rational Functions**  
**Day 1 Homework**

Name: \_\_\_\_\_  
 Date: \_\_\_\_\_ Period: \_\_\_\_\_

Simplify each rational expression and state any excluded values.

$$1. \frac{3x-3}{6}$$

$$= \frac{3(x-1)}{2 \cdot 3}$$

$$= \frac{x-1}{2}$$

$$3. \frac{x+2}{x^2+4x+4}$$

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

$$= \frac{1}{x+2}, x \neq -2$$

$$5. \frac{x^2+4x}{x^2-2x-24}$$

$$= \frac{x(x+4)}{(x+4)(x-6)}$$

$$= \frac{x}{x-6}, x \neq -4, x \neq 6$$

$$7. \frac{x^2-x-20}{x^2+2x-15}$$

$$= \frac{(x-5)(x+4)}{(x+5)(x-3)}, x \neq -5, x \neq 3$$

$$9. \frac{x^2+2x+1}{x^4-1}$$

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

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

$$= \frac{x+1}{(x-1)(x^2+1)}, x \neq -1, x \neq i, x \neq -i$$

\*  $x^2+1=0$   
 $x^2=-1$   
 $x=\pm i$

$$2. \frac{(x+7)(x-9)}{(x+9)(x+7)}$$

$$= \frac{x-9}{x+9}, x \neq -7, x \neq -9$$

$$4. \frac{x^2+4x-5}{x^2-25}$$

$$= \frac{(x+5)(x-1)}{(x+5)(x-5)}$$

$$= \frac{x-1}{x-5}, x \neq -5, x \neq 5$$

$$6. \frac{x^2+10x-11}{x^2+7x-8}$$

$$= \frac{(x+11)(x-1)}{(x+8)(x-1)}$$

$$= \frac{x+11}{x+8}, x \neq -8, x \neq 1$$

$$8. \frac{(x^3-5x^2)(3x+15)}{x^2-8x+15}$$

$$= \frac{x^2(x-5) \cdot 3(x+5)}{(x-5)(x-3)}$$

$$= \frac{(x^2-3)(x+5)}{(x-3)(x-5)} = \frac{x^2-3}{x-3}, x \neq 5, x \neq 3$$

$$10. \frac{2x^2-14x+20}{4x^2-16}$$

$$= \frac{2(x^2-7x+10)}{4(x^2-4)}$$

$$= \frac{2(x-5)(x-2)}{4(x+2)(x-2)}$$

$$= \frac{x-5}{2(x+2)}, x \neq 2, x \neq -2$$