SIMPLIFYING RATIONAL EXPRESSIONS

SECTION 11.4

How to simplify

Divide out a common factor on top and bottom of the fraction

**********Look for GCF's**********

Examples

1. $\frac{4x}{14} = \frac{2x}{7}$

2. $\frac{6x^2}{3x^5} = \frac{2}{x^3}$

3. $\frac{3xy^2}{9x} = \frac{1y^2}{3}$

4. $\frac{2x}{4(x-1)} = \frac{1x}{2(x-1)}$

Examples

5. $\dfrac{2x}{4x-8} = \dfrac{2x}{4(x-2)} = \dfrac{1x}{2(x-2)}$

6. $\dfrac{4x^2-8x}{12x} = \dfrac{4x(x-2)}{12x} = \dfrac{1(x-2)}{3}$

7. $\dfrac{2x+1}{2x}$ $\dfrac{2x+1}{2x}$

8. $\dfrac{x+3}{3x+9} = \dfrac{x+3}{3(x+3)} = \dfrac{1}{3}$

Examples

9. $\dfrac{x^2-4}{x^2-x-2}$

$\dfrac{(x-2)(x+2)}{(x-2)(x+1)}$

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

10. $\dfrac{3x^2-15x}{x^3-7x^2+10x}$

$= \dfrac{3x(x-5)}{x(x^2-7x+10)}$

$\dfrac{3x(x-5)}{x(x-5)(x-2)} = \boxed{\dfrac{3}{x-2}}$

Undefined Values

- Values that make the bottom of the expression equal to zero.
- To find: Set the bottom of the fraction equal to zero and solve

Examples

1. $\frac{x+2}{x-3}$ $x-3 \neq 0$ $x \neq 3$

2. $\frac{3x-7}{5x}$ $5x \neq 0$ $x \neq 0$

3. $\frac{x-4}{x^2-9}$ $x^2-9 \neq 0$ $(x-3)(x+3) \neq 0$ $x^2 \neq 9$ $x \neq \pm 3$ $x \neq \pm 3$

4. $\frac{3x}{x^2-6x+16}$ $x^2-6x+16 \neq 0$ $(x-8)(x+2) \neq 0$ $x \neq 8, -2$

Classwork

- Pg 667 # 4-8, 9 – 23 odd

(7) $\dfrac{6+2x}{x^2+5x+6} = \dfrac{2(3+x)}{(x+2)(x+3)} = \dfrac{2}{x+2}$

(13) $\dfrac{3x^2-18x}{-9x^2} = \dfrac{3x(x-6)}{-9x^2} = \dfrac{x-6}{-3x}$

Homework

- Pg 667 # 10-28 even