7.1 and 7.2 Evaluating and Simplifying Rational Expressions

Evaluate the following for x = 5 and y = -3

a) $\frac{x-2xy}{y} = \frac{(5)-2\cdot(5)\cdot(-3)}{(-3)}$

$= \frac{35}{-3}$

b) $\frac{2x-4y}{3x} = \frac{2\cdot(5)-4\cdot(-3)}{3\cdot(5)}$

$= \frac{22}{15}$

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Non-PermissableValue(s) OR Restrictions

These are values that we CANNOT use to evaluate and expression

* We look only at the denominator to determine our non-permissable Values.

$\frac{3}{ab}$

$a \neq 0$

$b \neq 0$

$\frac{-2xy}{x+2}$

$x+2 \neq 0$

$x \neq -2$

$\frac{3x}{x^2-4} = \frac{3x}{(x-2)(x+2)}$

$x \neq \pm 2$

$\frac{6x}{x^2-5x+6}$ $\frac{6x}{(x-3)(x-2)}$

$x-2 \neq 0$

$x \neq 2$

$x-3 \neq 0$

$x \neq 3$

-3
-2
-5

$\times 6$ $\frac{-3}{1}$ $\frac{-2}{1}$

$x \neq 2$

$x \neq 3$

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Steps for Simplifying Rational Expressions

1. Factor numerator and denominator completely
2. State restrictions or non-permissable values
3. Simplify expression using rules of mathematics

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$\frac{27a^3}{12a}$ $= \frac{9a^2}{4}$

$a \neq 0$

$\frac{3y^2+5y}{2y}$

$\frac{y(3y+5)}{2y} = \frac{3y+5}{2}$

$y \neq 0$

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$$\frac{x^2-3x-10}{x^2-4}$$

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

$x \neq \pm 2$

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$$\frac{16-m^2}{2m^2-5m-12} \quad -1$$

$$\frac{(4+m)(4-m)}{(2m+3)(m-4)}$$

$2m+3 \neq 0 \qquad m-4 \neq 0$

$2m \neq -3 \qquad m \neq 4$

$m \neq -\frac{3}{2}$

$$\frac{(4+m)\cdot -1}{(2m+3)}$$

$3 \quad -8 \quad x-24$

-5

$\frac{3}{2} \quad \frac{-8}{2}$

$\frac{3}{2} \quad -4$

1

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$$\frac{(4-m)}{(m-4)} \rightarrow \frac{-1(m-4)}{(m-4)}$$

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Assignment:

Pg. 402 6 odds, 11 odds

Pg. 407 2-4 odds
8
10 and 12 odds

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