April 19, 2016

7.3 Simplifying Rational Expressions

$$\frac{2x^4}{y^5} \cdot \frac{10y^6}{2y^2} \qquad \frac{2x^{4-2}}{y^{5-1}} \cdot \frac{5y^{6-1}}{x^2} \qquad \frac{x^2}{1} \cdot \frac{5y}{1} = \frac{5x^2y}{1} = \boxed{5x^2y}$$

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Steps
1. Factor anything first
2. Divide out Common "ones"
3. Ensure fraction is Relatively Prime!

$$\frac{x^2+x}{3x} \cdot \frac{6}{5x+5} \qquad \frac{x(x+1)}{3x} \cdot \frac{2\cdot 3}{5(x+1)} \qquad \boxed{\frac{2}{5}}$$

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$$\frac{3x+3}{5x-5x^2} \cdot \frac{2x^2+x-3}{4x^2-9}$$

$$\frac{3(x+1)}{5x(1-x)} \cdot \frac{(2x+3)(x-1)}{(2x+3)(2x-3)}$$ fully Factored!

$$\frac{3(x+1)}{5x(1-x)} \cdot \frac{(x-1)}{(2x-3)}$$ Can be simplified

$$\frac{(x-1)}{*(1-x)}$$

Factor out a (-1): $(1-x) \to -(-1+x) \to -(x-1)$

$$\frac{3(x+1)}{5x(x-1)} \cdot \frac{(x-1)}{(2x-3)}$$

note: (-1) stays

$$\frac{3(x+1)}{-5x} \cdot \frac{1}{(2x-3)} = \frac{3(x+1)}{-5x(2x-3)} = \boxed{-\frac{3(x+1)}{5x(2x-3)}}$$

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Division

$$\frac{3x^3y^7}{40} \div \frac{4x^3}{y^2}$$

Steps
1. KCF
2. Factor
3. Simplify "ones"

$$\frac{3x^3y^7}{40} \cdot \frac{y^2}{4x^3} \qquad \boxed{\frac{3y^9}{160}}$$

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Addition / Subtraction with Like Denominators

$$\frac{a}{b} \pm \frac{c}{b} = \frac{a \pm c}{b}$$

$$\frac{5x}{2y} + \frac{x}{2y} = \frac{5x+x}{2y} = \frac{3\cancel{6}x}{\cancel{2}y} = \boxed{\frac{3x}{y}}$$

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$$\frac{2x}{2x-5} - \frac{5}{2x-5}$$

$$\frac{2x-5}{2x-5} = \boxed{1}$$

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$$\frac{3x^2+2x}{x-1} - \frac{10x-5}{x-1}$$

$$\frac{3x^2+2x-(10x-5)}{x-1}$$

$$\frac{3x^2+2x-10x+5}{x-1}$$ now collect like terms

$$\frac{3x^2-8x+5}{x-1}$$ now factor

$$\frac{(3x-5)(x-1)}{x-1}$$

$$3x-5$$

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$$\frac{2x^2+5x}{x+2} - \frac{4x+6}{x+2}$$

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7.3 #1 – #13 odd

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