Simplify:

$$\frac{\frac{3}{x+2}}{\frac{1}{x+5}+\frac{10x}{x^2+7x+10}}$$

$$\frac{\frac{3}{x+2}\cdot\frac{(x+5)}{x+5}}{\frac{x+2}{x+2}\cdot\frac{1}{x+5}+\frac{10x}{(x+5)(x+2)}}=\frac{\frac{3x+15}{(x+5)(x+2)}}{\frac{x+2}{(x+5)(x+2)}+\frac{10x}{(x+5)(x+2)}}$$

$$=\boxed{\frac{3x+15}{11x+2}}$$

Simplify:

$$\frac{\frac{4x}{x^2+8x+7}}{\frac{5x}{x^2+6x-7}+\frac{6}{x^2-1}}=\frac{\frac{4x}{(x+7)(x+1)}}{\frac{5x}{(x+7)(x-1)}+\frac{6}{(x+1)(x-1)}}\cdot\frac{(x+7)(x+1)(x-1)}{(x+7)(x+1)(x-1)}$$

$$\frac{4x(x-1)}{5x(x+1)+6(x+7)}=\boxed{\frac{4x^2-4x}{5x^2+11x+42}}$$

$5x^2+5x+6x+42$

Simplify:

$$\frac{\frac{x}{3x^2-12}+\frac{4}{x^3+3x^2-10x}}{\frac{7}{2x^2+10x}-\frac{6}{x^2+7x+10}}\times(x^2+3x-10)$$

$3(x^2-4)$

$$=\frac{\frac{x}{3(x+2)(x-2)}+\frac{4}{x(x+5)(x-2)}}{\frac{7}{2x(x+5)}-\frac{6}{(x+5)(x+2)}}\cdot\frac{6x(x+5)(x+2)(x-2)}{6x(x+5)(x+2)(x-2)}$$

$2x^2$

$$=\frac{(2x)(x)(x+5)+4\cdot 6(x+2)}{2\cdot 3(x^2-4)-6\cdot 6x(x-2)}$$

$21 \qquad -36x$

$$=\frac{2x^3+10x^2+24x+48}{21x^2-84-36x^2+72x}=\boxed{\frac{2x^3+10x^2+24x+48}{-15x^2+72x-84}}$$

You can now finish Hwk #42

Sec 9-5

Due tomorrow

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Problems 26, 28, 44, 46 - 48

Solve. 1.

$$\frac{2x}{9} + \frac{7}{6} = \frac{5}{3}$$

Answer: $x = \frac{9}{4}$

Solving Rational Equations: Sec 9-6

Basic Steps:

1. Eliminate ALL denominators from the equation
2. Solve the equation that remains after eliminating denominators

1. Solve.

$$\frac{2}{2}\cdot\frac{2x}{9} + \frac{7}{6}\cdot\frac{3}{3} = \frac{5}{3}\cdot\frac{6}{6}$$

$$\frac{4x}{18} + \frac{21}{18} = \frac{30}{18}$$

$$4x + 21 = 30$$
$$-21 \quad -21$$
$$\frac{4x}{4} = \frac{9}{4}$$

$x = 9/4$

Method 1:

Get common Denominator for ALL terms of the equation then cancel out all denominators. Finish by solving remaining equation

1. Solve.

$$18\left(\frac{2x}{9} + \frac{7}{6}\right) = \left(\frac{5}{3}\right)18$$

$$4x + 21 = 30$$
$$-21 \quad -21$$
$$4x = 9$$

$x = 9/4$

Method 2:

Eliminate ALL Denominators by multiplying both sides of the equation by the LCM of all denominators. Finish by solving remaining equation

1. Solve.

$\frac{2}{2}\cdot\frac{2x}{9} + \frac{7}{6}\cdot\frac{3}{3} = \frac{5}{3}$

Method 3:

Simplify each side of the equation into a single ratio, creating a proportion. Then, cross multiply and solve.

$\frac{4x}{18} + \frac{21}{18} = \frac{5}{3}$

$\frac{4x+21}{18} = \frac{5}{3}$

$90 = 12x + 63$

$-63 \quad -63$

$\frac{27}{12} = \frac{12x}{12}$

$x = \frac{27}{12} = \frac{9}{4}$

Solve.

$\frac{2x}{5} = \frac{8}{x+1}$

$2x(x+1) = 40$

$2x^2 + 2x = 40$

$\frac{2x^2+2x-40}{2} = \frac{0}{2}$

$x^2 + x - 20 = 0$

$(x+5)(x-4) = 0$

$x = -5, 4$

-20

5 -4

1