1.

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

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

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

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

Simplify each.

2. $$\frac{\frac{7}{3x^3y^2z}-\frac{3x}{5y^5z^3}}{\frac{4}{9xy^4}+\frac{5}{x^4yz^2}}\left(45x^4y^5z^3\right)$$

$$\frac{7}{15xy^3z^3}-\frac{3x}{9x^4}$$

$$\frac{4}{5x^3yz^3}+\frac{5}{45y^4z}$$

$$=\frac{105xy^3z^2-27x^5}{20x^3yz^3+225y^4z}$$

3. $\dfrac{\left(\frac{9x}{x+2}+\frac{6}{x}\right)x^2(x+2)}{\left(\frac{5}{x^2}-\frac{7}{x+2}\right)x^2(x+2)} = \dfrac{9x^3+6x^2+12x}{5x+10-7x^2}$

LCD: $x^2(x+2)$

$= \dfrac{9x^3+6x^2+12x}{-7x^2+5x+10}$

Sec 9-6: Solving Rational Equations

1. Solve.

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

Method 1:

1. Make ALL terms in the equation have the same denominator.

2. Cancel out all denominators.

3. Finish by solving the resulting equation for x.

1. Solve.

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

Method 2:

1. Find the LCM of ALL denominators in the equation

2. Eliminate ALL Denominators by multiplying both sides of the equation by this LCM.

3. Finish by solving the resulting equation

1. Solve.

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

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

$$12x + 63 = 90$$

$$12x = 27$$

$$x = 9/4$$

27/12

Method 3:

1. Simplify each side of the equation into a single fraction, creating a proportion.

2. Cross multiply.

3. Solve the resulting equation.

Solve.

2. $\frac{4x}{x+1} = \frac{3}{7}$

$28x = 3x + 3$

$25x = 3$

$x = 3/25$

Solve.

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

$2x^2 + 2x = 40$

$2x^2 + 2x - 40 = 0$

$2(x^2 + x - 20) = 0$

$2(x+5)(x-4) = 0$

$x = -5, 4$

Solve

4. $\frac{6}{x} + \frac{7}{3} = \frac{9}{2x} - \frac{11}{12}$

$12x$

$72 + 28x = 54 - 11x$

$72 + 39x = 54$

$39x = -18$

$x = -18/39 = -6/13$

Solve

5. $\frac{5x}{4} - \frac{4x-3}{3x} = \frac{8x}{6}$

$12x$

$15x^2 - 4x + 12 = 16x^2$

$-15x^2 \quad\quad -15x^2$

$0 = x^2 + 4x - 12$

$(x+6)(x-2) = 0$

$x = 6, 2$

-12

$-2 \quad 6$

4

Two trains leave a station and travel for the same amount of time. The first train travels to Chicago, 480 miles away. The second train travels 5mph faster and travels to Pittsburgh, 510 miles away. Find the speed at which each train has traveled.

$d = r \cdot t$

$t = \frac{d}{r}$

	$d = r \cdot t$	
CHI	480	$r = 80$ mph
PIT	510	$r+5 = 85$ mph

t

$$\frac{480}{r} = \frac{510}{r+5}$$

$$510r = 480r + 2400$$

$$30r = 2400$$

$$r = 80$$

Solve.

$$\frac{-4}{5x+10} = \frac{2}{x+2}$$

If you got x=-2 then all of your work is correct but....

-2 is NOT the solution!

Steps to follow when solving equations

1. Blah, Blah, Blah

2. Blah, Blah, Blah

   •
   •
   •

Last Step: Check your answers

Extraneous Solutions

Solve.

$$\frac{-4}{5x+10} = \frac{2}{x+2}$$

x = -2 is an extraneous solution because it makes the equation undefined!

Solve. $\dfrac{x}{x^2-100} = \dfrac{1}{x^2-12x+20}$

$$\frac{(X-2)}{(X-2)}\frac{X}{(X+10)(X-10)} = \frac{1}{(X-10)(X-2)}\frac{(X+10)}{(X+10)}$$

$$X^2-2X = X+10$$

$$X^2-3X-10=0$$

$$(X-5)(X+2)=0$$

$$X=5,-2$$