Top-left panel

Solve. $\dfrac{1}{12} + \dfrac{5}{6x} = \dfrac{x}{24} + \dfrac{1}{2x}$

Get common denominators

$\dfrac{2x}{2x} \cdot \dfrac{1}{12} + \dfrac{5}{6x} \cdot \dfrac{4}{4} = \dfrac{x}{24} \cdot \dfrac{x}{x} + \dfrac{1}{2x} \cdot \dfrac{12}{12}$

$\dfrac{2x}{24x} + \dfrac{20}{24x} = \dfrac{x^2}{24x} + \dfrac{12}{24x}$

$2x + 20 = x^2 + 12$

$0 = x^2 - 2x - 8$

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

$\boxed{x = 4, -2}$

Cancel denominators.

$24x \left(\dfrac{1}{12} + \dfrac{5}{6x} \right) = \left(\dfrac{x}{24} + \dfrac{1}{2x} \right) 24x$

$2x + 20 = x^2 + 12$

this is the same quadratic so it will lead to the same two solutions:
x=4, -2

Top-right panel

John can ride 42 miles on his bike in the <u>same time</u> that it takes Amani to ride 52.5 miles on her bike. John rides his bike 3 mph slower than Amani does. Find the speed each person biked.

$d = r \cdot t$ EO

	d	r	t	
John	42	$r-3$	t	$42 = (r-3)t$
Amani	52.5	r	t	$52.5 = rt$

Using substitution you get this proportion:

$\dfrac{42}{r-3} \bcancel{=} \dfrac{52.5}{r}$

$42r = 52.5r - 157.5$
$-52.5r \quad -52.5r$

$-10.5r = -157.5$

$\boxed{r = 15}$

$t = \dfrac{42}{r-3}$ $\dfrac{52.5}{r} = t$

Amani biked 15 mph and John biked 15-3 = 12mph
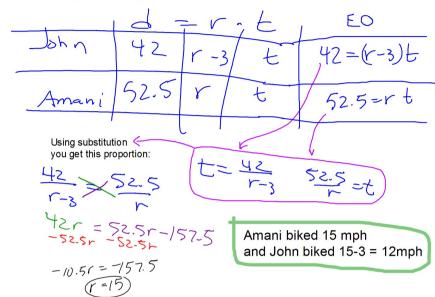
Bottom-left panel

Two trains leave a station travelling at the <u>same speed</u>. The first train travels to Baltimore, 240 miles away. The second train travels for 1hr 15 minutes longer and travels to NYC, 315 miles away. Find the time each train has traveled.

4 hrs Balt train

5 hrs 15 min NYC train

$r = \dfrac{240}{t}$

$r = \dfrac{315}{t + 1.25}$

Using substitution you get this proportion:

$\dfrac{240}{t} \bcancel{=} \dfrac{315}{t + 1.25}$

$315t = 240t + 300$

$75t = 300$

$t = 4$

Baltimore train travelled for 4 hrs and NYC train travelled for 4+1.25 = 5 hrs 15 min

Bottom-right panel

Hwk #10   Sec 9-6

Due tomorrow

Page 524

Problems 4, 6, 9, 14, 15, 21, 22

Solve. $\dfrac{-4}{5x+10} = \dfrac{2}{x+2}$

Solve by cross multiplying

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

$$-4x - 8 = 10x + 20$$

$$-28 = 14x$$

$$\cancel{x = -2}$$

-2 is an Extraneous Solution

NO SOL

Solve by getting common denominators

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

$$\dfrac{-4}{5(x+2)} = \dfrac{2}{(x+2)} \cdot \dfrac{5}{5}$$

$$\dfrac{-4}{5(x+2)} = \dfrac{10}{5(x+2)}$$

$$-4 = 10$$

This is not a true statement, therefore, this equation will never be true.

Basic Steps:

1. Eliminate ALL denominators from the equation

2. Solve the equation that remains after eliminating denominators

3. Check for extraneous solutions