Models Involving Rational Equations

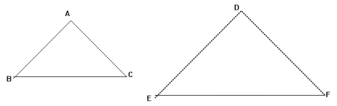
1. Solve the proportion.
(similar to p.511 #24)

$$\frac{x+9}{4} = \frac{x-4}{7}$$

2. Solve the proportion.
(similar to p.511 #28)

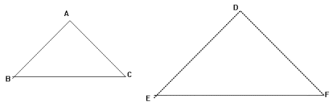
$$\frac{x+2}{5x-12} = \frac{3}{x}$$

3. Triangle ABC is similar to triangle DEF.
(similar to p.511 #34)



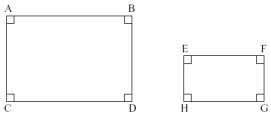
If DE = 10, EF = 8, AB = 30, find BC

4. Triangle ABC is similar to triangle DEF.
(similar to p.511 #36)



If AB = n, BC = n + 3, DE = 7, and EF = 10, find n and BC

5. Rectangle ABCD is similar to rectangle EFGH.
(similar to p.511 #36)



If DC = 10, FG = x - 3, DB = 4, and GH = 5x - 40 find x and HE

6. Write an equation that could be used to model each of the following. Setup but do not solve the equation. (similar to p.511 #43)

$$\frac{1}{time\ \ it\ \ took\ \ person\ \ A}+\frac{1}{time\ \ it\ \ took\ \ person\ \ B}=\frac{1}{time\ \ it\ \ took\ \ together}$$

David can paint a fence in 10 hours (he is slow) and Frank can paint the fence in 6 hours. How many hours will it take to paint the fence when David and Frank work together?

7. Write an equation that could be used to model each of the following. Setup but do not solve the equation. (similar to p.511 #44)

Sally can paint a fence in 8 hours. When she worked with Judy, it took only 3 hours. How long would it take Judy to paint the fence if she worked alone?

8. Write an equation that could be used to model each of the following. Setup but do not solve the equation. (similar to p.511 #45)

There are two different inlet pipes that can be used to fill a 2000-gallon tank. Pipe A takes 8 hours longer than Pipe B to fill the tank. With both pipes open, it takes 20 hours to fill the tank. How long would it take Pipe B alone to fill the tank?

9. Write an equation that could be used to model each of the following. Setup but do not solve the equation. (similar to p.512 #51)

$$\frac{distance\ \ upstream}{rate\ \ in\ \ still\ \ water-currentspeed}=\frac{distance\ \ downstream}{rate\ \ in\ \ still\ \ water+currentspeed}$$

David's boat travels at 10 mph in still water. Find the speed of the current if he can go 2 miles upstream in the same time that it takes to go 5 miles downstream.

10. Write an equation that could be used to model each of the following. Setup but do not solve the equation. (similar to p.512 #52)

$$\frac{distance\ \ upstream}{rate\ \ in\ \ still\ \ water-currentspeed}=\frac{distance\ \ downstream}{rate\ \ in\ \ still\ \ water+currentspeed}$$

A stream has a current of 5 mph. Find the speed of David's boat in still water if he can go 8 miles downstream in the same time as it takes to go 3 miles upstream.