Applications of Rational Expressions

Recall: $d = rt$, so $t = \dfrac{d}{r}$ and $r = \dfrac{d}{t}$

Ex 1.

A river has a current of 3 mph. A boat takes as long to go 12 mi downstream as to go 8 mi upstream.
What is the rate of the boat in still water?

Work Rate Problems

If Alice can erase 3 chalkboards per minute, and Bob can erase 2 chalkboards per minute, then how
many chalkboards per minute can they erase working together? _____

Ex 2.

You can mow a lawn in 1 hour. Your friend can mow the same lawn in 30 minutes.
How long will it take to mow working together?

Ex 3.

David and Katie are picking up little pieces of confetti that their son just dumped onto the floor. Katie works twice as fast as David. Working together, they can pick up all the pieces in two hours. How long would it take David, working alone, to finish the job (so that Katie can start cleaning up the milk that was spilled in the meantime)?

Practice

1. Suppose you can fly a plane 200 mi against the wind in the same time it takes you to fly 300 mi with the wind. The wind blows at 30 mph. Find the rate of your plane in still air.

2. A pond can be filled by one pipe in 8 hours and by a second pipe in 24 hours. How long will it take using both pipes to fill the pond?

3. Working with your cousin, you can refinish a table in 3 hours. Working alone, your cousin can complete the job in 4 hours. How long would it take you to refinish the table working alone?

Q: A man while looking at a photograph said, "Brothers and sisters have I none. That man's father is my father's son." Who was the person in the photograph?