

Formulas and Applications of Rational Expressions

Solving for a Variable

Ex 1.

Solve the following formula for x : $\frac{1}{x} + \frac{1}{y} = \frac{1}{z}$

Motion

$$d = rt$$

Ex 2.

Suppose your commute to Mt. SAC is 40 miles. You can go 30 miles per hour faster coming back than going there. If you want your round trip to take 2 hours, what would your average rate of travel going to Mt. SAC have to be?



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 3.

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 4.

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)?



Ex 5.

Suppose a faucet can fill an empty tub in 10 minutes (with the drain closed). It takes five times as long to empty the tub by opening the drain. How long would it take to fill the tub with the faucet on and the drain open?



Practice

1. Solve the following equation for q : $\frac{1}{p} + \frac{1}{q} = \frac{1}{f}$

2. A passenger train can travel 240 miles in the same amount of time it takes a freight train to travel 160 miles. If the rate of the freight train is 20 miles per hour slower than the rate of the passenger train, find the average rate of each. (Hint: find an expression for the time it takes the passenger train to travel 240 miles, and the time it takes for the freight train to travel 160 miles, then set them equal.)

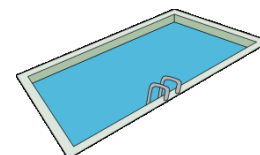
3. A pond can be filled by one pipe in 8 hours and by a second pipe in 24 hours. How long will it take using both pipes to fill the pond?



4. 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?



5. A pool can be filled by a pipe in 3 hours. It takes 3 times as long for another pipe to empty the pool. How long will it take to fill the pool if both pipes are open?



Q: What can't you keep until you have given it?