

Further Applications of Linear Equations

Mixture Problem

Ex 1.

A chemist needs to mix 20 L of a 40% acid solution with some 70% acid solution to obtain a mixture that is 50% acid. How many liters of the 70% acid solution should be used?

Simple Interest Problem

Ex 2.

You invest some money at 5% and \$3000 more than twice as much at 8%. The total annual income from the investments is \$1710. Find the amount invested at 5%.

Coin Problem

Ex 3.

A psychologist has \$2.55 in quarters and nickels. She has 9 more nickels than quarters. How many of each denomination of coin does she have?

Distance, Rate, Time Problem

distance = rate \times time

$$d = rt$$

Ex 4.

From a point on a straight road, two bicyclists ride in the same direction. One travels at a rate of 15 mph, the other at a rate of 18 mph. In how many hours will they be 5 mi apart?

What if they were riding in opposite directions?

Practice

1. How many gallons of 50% antifreeze must be mixed with 80 gal of 20% antifreeze to obtain a mixture that is 40% antifreeze?
2. You win a prize for your artwork. You invest part of the money in a certificate of deposit at 4% and \$3000 more than that amount in a bond paying 5%. Your annual interest income is \$780. How much did you invest at each rate?
3. The Los Angeles airport (LAX) and San Francisco airport (SFO) are 338 miles apart. A plane leaves LAX towards SFO at an average rate of 200 mph. At the same time, another plane leaves SFO towards LAX at an average rate of 150 mph. How long will it take them to meet?

Q: What can you catch, but not throw?