

7 A Strategy for Application Problems: Solutions

Concepts:

- Solving Application Problems Worksheet

(Section 2.3)

1. (Number 11 from Section 2.3 of your textbook) A radiator contains 8 quarts of fluid, 40% of which is antifreeze. How much fluid should be drained and replaced with pure antifreeze so that the new mixture is 60% antifreeze?

We should drain and replace $\frac{8}{3}$ quarts of fluid.

2. (Number 19 from Section 2.3 of your textbook) A 13 foot long ladder leans on a wall. The bottom of the ladder is 5 feet from the wall. If the bottom is pulled out 3 feet farther from the wall, how far does the top of the ladder move down the wall?

The top moves down $12 - \sqrt{105} \approx 1.753$ feet.

3. A chemist has two large containers of hydrochloric acid(HCl) solution. The concentration of the acid is different in the two containers. She blends 150mL of the first solution with 50mL of the second solution to obtain a solution that is 14.750% acid. She blends 350mL of the first solution with 50mL of the second solution to obtain a solution that is 15.875% acid. What are the concentrations of hydrochloric acid in the original containers?

In the first container, the chemist has a 17% acid solution. In the second container, the chemist has an 8% acid solution.

4. (Number 25 from Section 2.3 of your textbook) Red Riding Hood drives the 432 miles to Grandmother's house in 1 hour less than it takes the Wolf to drive the same route. Her average speed is 6 mph faster than the Wolf's average speed. How fast does each drive?

Red Riding Hood drives at 54 mph, and the Wolf drives at 48 mph.

5. (Number 15 from Section 2.3 of your textbook) The average of two numbers is 41.125, and their product is 1683. What are the numbers?

The numbers are 44 and 38.25.

6. (Number 26 from Section 2.3 in your textbook) To get to work, Sam jogs 3 kilometers to the train and then rides the remaining 5 kilometers. If the train goes 40 kilometers per hour faster than Sam's constant rate of jogging and the entire trip takes 30 minutes, how fast does Sam jog?

Sam jogs at an approximate rate of 7.5959 kilometers per hour.