4.3 Word Problem on Proportions: Problem Type 3

• Example 1

If 3 people can complete a job in 4 hours, how many people would be needed to complete the same job in $\frac{1}{2}$ hour? Assume the people work at the same rate.

If 3 people can complete a job in 4 hours,

1 person could complete the job in 12 hours (because $3 \times 4 = 12$).

n people would complete the job in $\frac{12}{n}$ hours.

For the job to be finished in $\frac{1}{2}$ hour we need 24 people, since $n = 24$ is the solution of the equation

$$\frac{12}{n} = \frac{1}{2}.$$

CHECK YOURSELF

If 2 machines can complete a task in 4 days, how many machines are needed to finish the task in 8 days? Assume the machines work at the same rate.

CHECK YOURSELF ANSWER

1. 1 machine.

4.3 Exercises

Name

Section Date

ANSWERS

1.

2.

3.

4.

5.

Solve the following applications.

1. **Oil change.** At an oil change shop, each mechanic can change the oil of 3 cars in $\frac{1}{2}$ hour. How long would it take 5 mechanics to change the oil of 30 cars?

2. **Tomato harvest.** If 2 farmers can harvest 10 bushels of tomatoes in 2 hours, how many farmers are needed to harvest 80 bushels of tomatoes in 1 hour? Assume all farmers harvest at the same rate.

3. **Working.** If 6 people can complete a job in 3 hours, how long would it take 2 people to complete the same job? Assume the people work at the same rate.

4. **Plant food.** If 10 plants require 20 milliliters (mL) of plant food every 3 days, how many mL of plant food would 50 plants require over a period of 9 days?

5. **Bakery.** If 4 bakers can frost 6 cakes in 30 minutes, how many minutes would it take 20 bakers to frost 15 cakes? Assume all bakers frost cakes at the same rate.