

1.12 Practice Set

1. How is the rate at which one works related to the amount of time it takes to complete a task? Give an example.
2. How are the mathematical models of the distance-rate-time problem and the work related problems similar? How are they different?

Set up each word problem as an equation and solve. Make sure to answer the question that is being asked.

3. If Mark can paint a room in 4 hours while it takes Martha 3 hours to do the same job, how long would it take them if they worked together?
4. Three teachers can create an assignments about equation solving in 30 minutes, 30 minutes and 60 minutes, respectively. Find how long it takes them if they work together.
5. A car can travel 400 miles in the same amount of time it takes a bike to travel 120 miles. The speed of the car was 50 mph faster than the speed of the bike. What was the speed of the car?

6. The speed of a river current is 5 mph. If a boat travels 20 miles upstream in the same amount of time that it takes to travel 30 miles downstream, find the speed of the boat in still water.
7. One hose can fill a small hot tub in 2 hours and two hoses can fill the hot tub in 80 minutes. How long would it take the second hose to fill the hot tub on its own?
8. Two trains going in opposite directions leave the train station at the same time. The second train has a speed which is 20mph faster than the first train. In 10 hours, the trains are 1000 miles apart. Find the speed of each train.
9. A factory has three conveyor belts that they use for production. The conveyor belts can move 10,000 products in 6 hours, 7 hours and 9 hours, respectively. How long would it take all three conveyor belts working together to move 10,000 products?
10. A jet flies 480 miles with the wind and 430 miles against the wind in the same amount of time. If the speed of the wind is 15 mph, find the speed of the jet if no wind were present.
11. Two runners enter a marathon. The first runner averages 4 mph and the second runner averages 8 mph. The second runner finishes first - 30 minutes before the first runner. Find the distance of the marathon.

12. Every 5 minutes, a customer is served at the local deli. Every 8 minutes, a customer is served at the local bakery next door. If the businesses are planning to merge and keep their customers, how many minutes apart would customers be served at the new business?
13. It takes Jose 3 hours to complete a factory inspection and it takes John 7 hours to do the same inspection. How long would it take them to do the inspection if they worked together?
14. A construction worker can build a wall in 8 hours. If a trainee joins the worker, together they can build the same wall in 10 hours. How long would it take the trainee to build the wall working alone?
15. The rate of traffic flow one way on the freeway is 30 mph slower than the other direction. If Colin made a round trip of 120 miles in 3 hours, how fast was the rate of flow on each side of the freeway?

Distributed Practice Problems

Solve each of the following equations for the indicated variable.

16. $S = ry - 7$ for r
17. $M = K(NL + 5)$ for N
18. $x = y(m + n)$ for m
19. $\left| \frac{x}{4} - 5 \right| = 9$

$$20. \quad |3y| + 2 = 7$$

$$21. \quad x(5x + 12) = 9$$

$$22. \quad \frac{y^2}{6} - \frac{3y}{2} = 6$$

$$23. \quad z^3 + z^2 = 16z + 16$$

Simplify each of the following expressions.

$$24. \quad \frac{7^{-1}x^5yz}{x^{-3}yz^2}$$

$$25. \quad (9x^5y^3)^{-2}(5x^4y^{-3})^2$$