

Practice: Creating Rational Equations**B**

For problems 1 and 2, simplify each rational expression and state any restrictions on the value of x .

1.
$$\frac{4x+4}{8x^2-16x-24}$$

2.
$$\frac{10x^2-90}{5x-15}$$

For problems 3 and 4, write a rational function that represents the situation. Then use the function to create equations that can be solved to solve the problem. Then answer the questions.

3. Careta has put into play 20 of 32 serves in her volleyball games. How many consecutive serves must she put into play to raise her serving percentage to 70%?
4. Pavel is a member of the tutoring club. He has attended 15 of 20 help sessions. To be eligible for a service award, he must attend 80% of the sessions. How many consecutive help sessions must he attend to reach the goal?

For problems 5–10, write a rational equation, solve it, and then answer the question.

5. Ulrich and Jacinta work for a cleaning business to earn college tuition money. Jacinta can clean a client's apartment in 1 hour 20 minutes if she works alone. Ulrich and Jacinta can clean the apartment in 48 minutes if they work together. How long does it take Ulrich to clean the apartment if he works alone? Assume both people work at steady rates and their rates are not affected by either working alone or working together.
6. DeAnne needs to fill her swimming pool. She has two hoses of different diameters. Using hose A alone, it would take 16 hours to fill the pool. Using hoses A and B together, it would take 7 hours. How long would it take to fill the pool using hose B alone?

continued

Name: _____

Date: _____

7. Massimo owns a heating oil company. He has two trucks of different capacities for delivering oil. An employee can deliver to all the customers in the valley region in 6 hours less time by using truck A than by using truck B. If two employees deliver in the same region, using both trucks, then it takes 8 hours 45 minutes to deliver to all the customers in the region. How long does it take to deliver to all the customers in the region, using each truck alone? Assume the individual delivery rates are not affected by whether one truck is being used or both trucks are being used.

8. Nasir and Danitza work for a caterer. Nasir can prepare a customer's regular lunch order in 45 minutes less time than it takes Danitza to prepare the same order. Working together, they can prepare the order in 45 minutes. How long does it take each person to prepare the order, working alone? Assume both people work at steady rates and their rates are not affected by either working alone or working together.

9. A construction crew ran a generator nonstop from 8:00 A.M. until 2:00 P.M., using gasoline at an average rate of 0.8 hour per gallon. Then they added a different model generator and ran both generators nonstop from 2:00 P.M. until 6:00 P.M. For the entire 10 hours the average rate of gasoline use was 0.5 hour per gallon. What was the rate of gasoline use from 2:00 P.M. until 6:00 P.M., when both generators were running, in hours per gallon?

10. An airplane has a scheduled round-trip flight between two cities, 1,600 miles each way. On the outgoing flight, heading into a strong wind, the plane's average speed was 440 miles per hour. What must be its average speed on the return flight to attain an overall average speed of 500 miles per hour for the entire round-trip flight?