Name: **Date:**

Practice: Creating Rational Equations A

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

1. $\dfrac{5x+15}{5x^2+5x-30}$

2. $\dfrac{6x-12}{3x^2-3x-6}$

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

3. Alicia has had 16 hits in 46 at-bats in her softball games. How many consecutive hits does she need to raise her batting average to 0.400?

4. Mr. Ortiz is a driving instructor. Of his students, 23 have taken the driver's test, and 17 of them have passed on the first attempt. Mr. Ortiz earns a $300 bonus if 80% of his students pass the test on the first attempt. How many consecutive students must pass on the first attempt in order for Mr. Ortiz to earn the bonus?

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

5. Juliana and Sarah assemble bicycles at City Wheels Bike Shop. Juliana can assemble a City Cruiser in 20 minutes if she works alone. Juliana and Sarah assembled 16 City Cruisers in 2 hours when they worked together. How many minutes does it take Sarah to assemble one City Cruiser if she works alone? Assume both women work at steady rates and their rates are not affected by either working alone or working together.

6. Pump A can unload an oil tanker in 36 hours 30 minutes if it works alone. Pumps A and B can unload the tanker in 16 hours 30 minutes when they work together. How long does it take pump B to unload the tanker if it works alone?

continued

Name: **Date:**

7. Arthur can complete a customer's order in 15 fewer minutes by using copy machine A than by using copy machine B. By using both machines, he can complete the order in 18 minutes. How long does it take Arthur to complete the order by using each machine alone?

8. Natasha and Tobias have a cleaning business. Natasha can clean and wax the floors in an office building in 2 hours 30 minutes less time than it takes Tobias to do the same job. Working together, they can complete the job in 8 hours. How long does it take each person to complete the job, working alone? Assume both people work at steady rates and their rates are not affected by either working alone or working together.

9. Crystal owns a kennel business. The number of dogs she keeps varies. During the last 5 days in June, the dogs consumed dog food at the rate of 4 days per bag. During the last 5 days in June and the first 7 days in July combined, the rate was 5 days per bag. At what rate, in days per bag, did the dogs consume dog food during the first 7 days in July?

10. Ted and Brett went on a two-day backpacking trip in the mountains. On the first day they hiked 10 miles at an average rate of 2.25 miles per hour. On the second day they hiked 12 miles. Their average rate for the entire 22 miles was 2 miles per hour. What was their average rate on the second day?