CHAPTER 8

Mid-Chapter Quiz

Lessons 8-1 through 8-4

Simplify each expression. (Lesson 8-1)

1. $\frac{t^2 - t - 6}{t^2 - 6t + 9}$

2. $\frac{3ab^3}{8a^2b} \cdot \frac{4ac}{9b^4}$

3. $\frac{-4}{8x} \div \frac{16}{2xy^2}$

4. $\frac{48}{6a + 42} \cdot \frac{7a + 49}{16}$

5. $\frac{w^2 + 5w + 4}{6} \div \frac{w + 1}{18w + 24}$

6. $\frac{\frac{x^2 + x}{x + 1}}{\frac{x}{x - 1}}$

7. MULTIPLE CHOICE For all $t \neq 5$, $\frac{t^2 - 25}{3t - 15} =$ (Lesson 8-2)

A $\frac{t - 5}{3}$.

B $\frac{t + 5}{3}$.

C $t - 5$.

D $t + 5$.

Simplify each expression. (Lesson 8-2)

8. $\frac{4a + 2}{a + b} + \frac{1}{-b - a}$

9. $\frac{2x}{5ab^3} + \frac{4y}{3a^2b^2}$

10. $\frac{5}{n + 6} - \frac{4}{n - 1}$

11. $\frac{x - 5}{2x - 6} - \frac{x - 7}{4x - 12}$

For Exercises 12–14, use the following information.

Lucita is going to a beach 100 miles away. She travels half the distance at one rate. The rest of the distance, she travels 15 miles per hour slower. (Lesson 8-2)

12. If x represents the faster pace in miles per hour, write an expression that represents the time spent at that pace.

13. Write an expression for the amount of time spent at the slower pace.

14. Write an expression for the amount of time Lucita needed to complete the trip.

Graph each rational function. (Lesson 8-3)

15. $f(x) = \frac{x - 1}{x - 4}$

16. $f(x) = \frac{-2}{x^2 - 6x + 9}$

17. MULTIPLE CHOICE What is the range of the function $y = \frac{x^2 + 8}{2}$? (Lesson 8-3)

F $\{y | y \neq \pm 2\sqrt{2}\}$

G $\{y | y \geq 4\}$

H $\{y | y \geq 0\}$

J $\{y | y \leq 0\}$

WORK For Exercises 18 and 19, use the following information. (Lesson 8-3)

Andy is a new employee at Quick Oil Change. The company's goal is to change every customer's oil in 10 minutes. So far, he has changed 13 out of 20 customers' oil in 10 minutes. Suppose Andy changes the next x customers' oil in 10 minutes. His 10-minute oil changing percentage can be determined using $P(x) = \frac{13 + x}{20 + x}$.

18. Graph the function.

19. What domain and range values are meaningful in the context of the problem?

Find each value. (Lesson 8-4)

20. If y varies inversely as x and $x = 14$ when $y = 7$, find x when $y = 2$.

21. If y varies directly as x and $y = 1$ when $x = 5$, find y when $x = 22$.

22. If y varies jointly as x and z and $y = 80$ when $x = 25$ and $z = 4$, find y when $x = 20$ and $z = 7$.

For Exercises 23–25, use the following information.

In order to remain healthy, a horse requires 10 pounds of hay a day. (Lesson 8-4)

23. Write an equation to represent the amount of hay needed to sustain x horses for d days.

24. Is your equation a *direct*, *joint*, or *inverse* variation? Explain.

25. How much hay do three horses need for the month of July?