

## Chapter 9 Test Review

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Find points of discontinuity, the domain, and  $x$ - and  $y$ -intercepts of each rational function. Determine if the discontinuities are *removable* or *non-removable*.

1.  $y = \frac{x+5}{x-2}$

2.  $y = \frac{1}{x^2+2x+1}$

3.  $y = \frac{x+4}{x^2+2x-8}$

4.  $y = \frac{x+6}{x+4}$

5.  $y = \frac{(x-2)(x-1)}{x-2}$

6.  $y = \frac{x+1}{(3x-2)(x-3)}$

7.  $y = \frac{x+1}{x+5}$

8.  $y = \frac{x+2}{2x^2-4}$

9.  $y = \frac{3x^3-4}{4x+1}$

Simplify. State any restrictions on the variables.

10.  $\frac{5x^2y}{10xy^4}$

11.  $\frac{4d^2+8d}{2d}$

12.  $\frac{x^2+9x+18}{x+6}$

13.  $\frac{2x^2+7x+3}{x-4} \cdot \frac{x^2-16}{x^2+8x+15}$

14.  $\frac{x^2-2x-8}{x+3} \div \frac{x-4}{x+3}$

15.  $\frac{4x^2-1}{2x^2-5x-3} \cdot \frac{x^2-6x+9}{2x^2+5x-3}$

16.  $\frac{3x+1}{x^2-6x-6} \div \frac{6x^2+11x+3}{x^2+4x+4}$

17.  $\frac{3x^4-x^3-2x^2}{6x^2-2x-4}$

Simplify each sum or difference. State any restrictions on the variables.

18.  $\frac{6x+1}{x+2} + \frac{2x-5}{2x+4}$

19.  $\frac{8}{x^2-25} + \frac{9}{x-5}$

20.  $\frac{x-3}{x^2+3x} + \frac{7}{x+3}$

21.  $\frac{3x}{x^2+5x+6} - \frac{2x}{x^2+8x+16}$

22.  $\frac{2}{x^2-1} - 3$

23.  $\frac{2x}{x-5} - \frac{x}{x+7}$

**Chapter 9 Test Review** (continued)

Solve each equation. Check each solution.

24.  $\frac{x}{4} = \frac{x+1}{3}$

25.  $\frac{2}{x^2-1} = \frac{4}{x+1}$

26.  $\frac{3x}{5} + \frac{4}{x} = \frac{4x+1}{5}$

27.  $\frac{3x}{x-2} = 4 + \frac{x}{5}$

28.  $x + \frac{x}{4} - \frac{x}{5} = 21$

29.  $\frac{3}{x+4} + \frac{5}{4} = \frac{18}{x+4}$

30. You can paint a fence twice as fast as your sister can. Working together, the two of you can paint a fence in 6 h. How many hours would it take each of you working alone?

31. You can travel 40 mi on your motorbike in the same time it takes your friend to travel 15 mi on his bicycle. If your friend rides his bike 20 mi/h slower than you ride your motorbike, find the speed for each bike. (*Use the Distance Formula*)

32. A passenger train travels 392 mi in the same time that it takes a freight train to travel 322 mi. If the passenger train travels 20 mi/h faster than the freight train, find the speed of each train. (*Use the Distance Formula*)