

Differentiated Instruction Resources

- **L3** Ch. 9 Test
- **L2** Adapted Ch. 9 Test
- **L4** Ch. 9 Alternative Assessment
- **L3** Spanish Ch. 9 Test
- **L4** Spanish Ch. 9 Alternative Assessment
- ExamView CD-ROM
  - Ch. 9 Pre-Made Test
  - Make your own Ch. 9 test
- Online Chapter 9 Test at [www.PHSchool.com](http://www.PHSchool.com)

Write a function that models each variation.  $y = \frac{-16}{x}$

- $x = 2$  when  $y = -8$ .  $y$  varies inversely with  $x$ .
- $x = 0.2$  and  $y = 3$  when  $z = 2$ .  $z$  varies jointly with  $x$  and  $y$ .  $z = \frac{10}{3}xy$
- $x = \frac{1}{3}$ ,  $y = \frac{1}{5}$ , and  $r = 3$  when  $z = \frac{1}{2}$ .  $z$  varies directly with  $x$  and inversely with the product of  $r^2$  and  $y$ .  $z = \frac{2.7x}{r^2y}$

Is the relationship between the values in each table a direct variation, an inverse variation, or neither? Write an equation to model any direct or inverse variation.

4.	x	3	5	7	9	neither
	y	6	8	10	12	

5.	x	4	6	8	10	neither
	y	10	8	6	4	

6.	x	4	8	16	32
	y	32	16	8	4

inverse variation;  $y = \frac{128}{x}$

Graph the translation of  $y = \frac{7}{x}$  with the given asymptotes. Write the equation of the translation.

- $x = 1$ ;  $y = 2$
- $x = -3$ ;  $y = -2$

7–8. See back of book.

For each rational function, identify any holes, or horizontal or vertical asymptotes of its graph.

- $y = \frac{x+1}{x-1}$
- $y = \frac{x+3}{x+3}$
- $y = \frac{x-2}{(x+1)(x-2)}$
- $y = \frac{2x^2}{x^2-4x}$
- $y = \frac{1}{x+2} - 3$
- $y = \frac{5}{x-2} + 1$
- $y = \frac{x^2+5}{x-5}$
- $y = \frac{x+2}{(x+2)(x-3)}$

9–16. See margin.

Simplify each rational expression. State any restrictions on the variable.

- $\frac{x^2+7x+12}{x^2-9}$   $\frac{x+4}{x-3}$ ;  $x \neq -3$  or  $3$
- $\frac{(x+3)(2x-1)}{x(x+4)} \div \frac{(-x-3)(2x+1)}{x}$  See back of book.

- Open-Ended** Write a function whose graph has a horizontal asymptote but no vertical asymptote.

Check students' work.

Find the least common multiple of each pair of polynomials.

- $3x + 5$  and  $9x^2 - 25$   $9x^2 - 25$
- $5(x+3)(x+1)$  and  $2(x+1)(x-3)$   $10(x+3)(x+1)(x-3)$

Simplify each sum or difference.

- $\frac{x+2}{(x-3)(x+1)} + \frac{(x-1)(x+2)}{x-3}$   $\frac{x^2(x+2)}{(x-3)(x+1)}$
- $\frac{x^2-1}{(x-2)(3x-1)} - \frac{x+1}{x+3}$   $-\frac{(x+1)(2x^2-9x+5)}{(x-2)(3x-1)(x+3)}$
- $\frac{x(x+4)}{x-2} + \frac{x-1}{x^2-4}$   $\frac{x^3+6x^2+9x-1}{x^2-4}$

Simplify each complex fraction.

- $\frac{\frac{2}{x}}{1-\frac{1}{y}}$   $\frac{2y}{x(y-1)}$
- $\frac{3-\frac{3}{4}}{\frac{1}{2}-\frac{1}{4}}$   $9$

Solve each equation. Check each solution.

- $\frac{x}{2} = \frac{x+1}{4}$   $1$
- $\frac{3}{x-1} = \frac{4}{3x+2}$   $-2$
- $\frac{3x}{x+1} = 0$   $0$
- $\frac{3}{x+1} = \frac{1}{x^2-1}$   $\frac{4}{3}$
- $\frac{1}{x} + \frac{1}{3} = \frac{6}{x^2}$   $-6$  or  $3$
- $\frac{1}{x} + \frac{x}{x+2} = 1$   $2$

- Almir can seal a driveway in 4 hours. Working together, he and Louis can seal it in 2.3 hours. How long would it take Louis to seal it working alone?  $\approx 5.4$  h

Two standard number cubes are tossed. State whether the events are mutually exclusive. Then find  $P(A \text{ or } B)$ .

- $A$  means their sum is 12;  $B$  means both are odd **mutually exclusive;  $\frac{1}{9}$**
- $A$  means they are equal;  $B$  means their sum is a multiple of 3 **not mutually exclusive;  $\frac{4}{9}$**

- a. Writing** Suppose you select a number at random from the set  $\{90, 91, 92, \dots, 99\}$ . Event  $A$  is selecting a multiple of 3. Event  $B$  is selecting a multiple of 4. Are these two events mutually exclusive? Explain.
  - Find  $P(A \text{ and } B)$ .  $\frac{1}{10}$
  - Find  $P(A \text{ or } B)$ .  $\frac{1}{2}$

**a. No; 96 is a multiple of both 3 and 4.**

Adapted Chapter Test **L2**

Chapter Test **L3**

Chapter Test  
Chapter 9

Write a function that models each variation.

- $x = -1$  when  $y = 5$ .  $y$  varies inversely as  $x$ .
- $x = 3$  and  $y = 12$  when  $z = 2$ .  $z$  varies directly with  $x$  and inversely with  $y$ .

Is the relationship between the values in each table a direct variation, an inverse variation, or neither? Write an equation to model any direct or inverse variation.

- |   |    |    |    |
|---|----|----|----|
| x | -2 | 4  | 8  |
| y | 4  | -8 | 12 |
- |   |    |    |   |
|---|----|----|---|
| x | -2 | -1 | 3 |
| y | 1  | -1 | 1 |

Write an equation for the translation of  $y = \frac{7}{x}$  with the given asymptotes.

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

For each rational function, identify any holes or horizontal or vertical asymptotes of its graph.

- $y = \frac{x-2}{x+1}$
- $y = \frac{-2(x-3)}{(x-3)}$
- $y = \frac{1}{x^2-25}$
- $y = \frac{1}{x-2} - 3$
- $y = \frac{5}{x-2} + 1$
- $y = \frac{x^2+5}{x-5}$
- $y = \frac{x+2}{(x+2)(x-3)}$

Sketch the graph of each rational function.

- $y = \frac{1}{x^2-25}$
- $y = \frac{1}{x-2} - 3$

Simplify each rational expression. State any restrictions on the variable.

- $\frac{x^2-1}{x^2+4}$
- $\frac{2x^2}{x^2-4x}$
- $\frac{x^2+7x+12}{x^2-9}$
- $\frac{x+4}{x-3}$ ;  $x \neq -3$  or  $3$
- $\frac{(x+3)(2x-1)}{x(x+4)} \div \frac{(-x-3)(2x+1)}{x}$
- See back of book.

Find the least common multiple of each pair of polynomials.

- $x^2 - 16$  and  $5x + 20$
- $7(x-2)(x+5)$  and  $2(x+5)^2$

Simplify each sum or difference.

- $\frac{x+2}{(x-3)(x+1)} + \frac{(x-1)(x+2)}{x-3}$
- $\frac{x^2-1}{(x-2)(3x-1)} - \frac{x+1}{x+3}$
- $\frac{x(x+4)}{x-2} + \frac{x-1}{x^2-4}$

23. Writing Explain what it means for a rational expression to be in simplest form.

9. vertical asymptote  $x = 1$ , horizontal asymptote  $y = 1$

10. hole at  $x = -3$

11. hole at  $x = 2$ , vertical asymptote  $x = -1$ , horizontal asymptote  $y = 0$

12. hole at  $x = 0$ , vertical asymptote  $x = 4$ , horizontal asymptote  $y = 2$

13. vertical asymptote  $x = -2$ , horizontal asymptote  $y = -3$

14. vertical asymptote  $x = 2$ , horizontal asymptote  $y = 1$

15. vertical asymptote  $x = 5$

16. hole at  $x = -2$ , vertical asymptote  $x = 3$ ; horizontal asymptote at  $y = 0$