

## 8-6

## Practice

Form K

## Solving Rational Equations

Solve each equation. Check each solution.

To start, multiply each side by the LCD.

1.  $\frac{x}{4} - \frac{3}{x} = \frac{1}{4}$

2.  $x + \frac{6}{x} = -5$

3.  $\frac{5}{2x-2} = \frac{15}{x^2-1}$

$$4x\left(\frac{x}{4} - \frac{3}{x}\right) = (4x)\left(\frac{1}{4}\right)$$

4. The aerodynamic covering on a bicycle increases a cyclist's average speed by 10 mi/h. The time for a 75-mi trip is reduced by 2 h.
- Using  $t$  for time, write a rational equation you can use to determine the average speed using the aerodynamic covering.
  - What is the average speed for the trip using the aerodynamic covering?

Using a graphing calculator, solve each equation. Check each solution.

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

6.  $x + 5 = \frac{6}{x}$

7.  $\frac{2}{x+7} = \frac{x}{x^2-49}$

Solve each equation for the given variable.

8.  $F = \frac{mv^2}{r}$  for  $v$

9.  $\frac{c}{dt} = Qm$  for  $d$

10.  $\frac{F}{Gm_1} = \frac{m_2}{r^2}$  for  $r$

**8-6****Practice** (continued)

Form K

## Solving Rational Equations

- ~~11. 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.~~
- ~~12. 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.~~
- ~~13. 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?~~

Solve each equation. Check each solution.

14. 
$$\frac{2}{x-3} - \frac{4}{x+3} = \frac{8}{x^2-9}$$

15. 
$$\frac{3}{x+5} + \frac{2}{5-x} = \frac{-4}{x^2-25}$$

16. 
$$\frac{3}{x^2-1} + \frac{4x}{x+1} = \frac{1.5}{x-1}$$

- ~~17. You are planning a school field trip to a local theater. It costs \$60 to rent the bus. Each theater ticket costs \$5.50.~~
- ~~a. Write a function  $c(x)$  to represent the cost per student if  $x$  students sign up for the trip.~~
- ~~b. How many students must sign up if the cost is to be no more than \$10 per student?~~

# 10-2 Practice

## Parabolas

Form K

Write an equation of a parabola with vertex at the origin and the given focus.

1. focus at  $(0, 2)$

2. focus at  $(-5, 0)$

3. focus at  $(0, -1)$

4. focus at  $(3, 0)$

Identify the vertex, the focus, and the directrix of the parabola with the given equation. Then sketch the graph of the parabola.

5.  $y = \frac{1}{6}x^2$  This is a vertical parabola with vertex at  $(0, 0)$ .

The focus is at  $(0, 1.5)$ .The directrix is .

6.  $x = -2y^2$

7.  $y = \frac{3}{2}x^2$

Write an equation of a parabola with vertex at the origin and the given directrix.

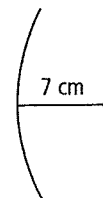
8. directrix  $x = -4$

9. directrix  $y = 10$

10. directrix  $y = -3$

11. directrix  $x = 1$

12. A cross section of a satellite dish is a parabola. The receiver is located at the focus. Suppose the receiver is located 7 cm from the vertex of the dish. Model a cross section of the satellite dish by writing an equation of a parabola that opens to the right and has its vertex at the origin.



**10-2 Practice** (continued)  
Parabolas

Form K

Identify the vertex, the focus, and the directrix of the parabola with the given equation. Then sketch the graph of the parabola.

13.  $y = x^2 - 6x + 3$

Start by writing the equation in vertex form by completing the square.

14.  $x = y^2 - 2y - 1$

15.  $y = \frac{1}{2}x^2 + 2x - 3$

Write an equation of a parabola with the given vertex and focus.

16. vertex (0, 4); focus (0, 0)

17. vertex (3, 6); focus (6, 6)

Write an equation of a parabola with vertex at (2, 3) and the given information.

18. focus (2, 3.5)

19. directrix  $x = 0$

20. **Writing** Explain how to find the vertex of the parabola  $x = y^2 + 4y - 9$ .