Name _____ Date _____

7.5 Solving Rational Equations

For use with Exploration 7.5

Essential Question How can you solve a rational equation?

1 EXPLORATION: Solving Rational Equations

Work with a partner. Match each equation with the graph of its related system of equations. Explain your reasoning. Then use the graph to solve the equation.

a. $\frac{2}{x-1} = 1$

b. $\frac{2}{x-2} = 2$

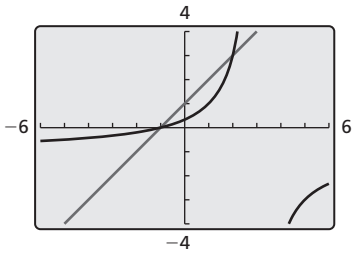
c. $\frac{-x-1}{x-3} = x+1$

d. $\frac{2}{x-1} = x$

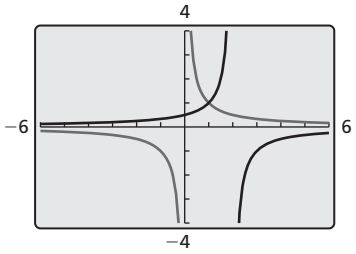
e. $\frac{1}{x} = \frac{-1}{x-2}$

f. $\frac{1}{x} = x^2$

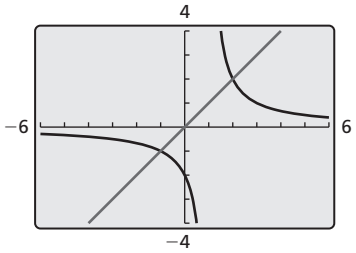
A.



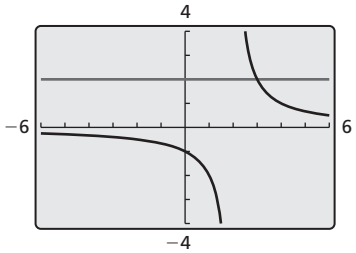
B.



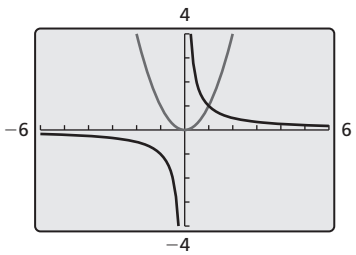
C.



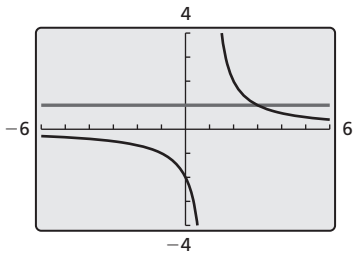
D.



E.



F.



7.5 Solving Rational Equations (continued)

2 EXPLORATION: Solving Rational Equations

Go to *BigIdeasMath.com* for an interactive tool to investigate this exploration.

Work with a partner. Look back at the equations in Explorations 1(d) and 1(e). Suppose you want a more accurate way to solve the equations than using a graphical approach.

a. Show how you could use a *numerical approach* by creating a table. For instance, you might use a spreadsheet to solve the equations.

b. Show how you could use an *analytical approach*. For instance, you might use the method you used to solve proportions.

Communicate Your Answer

3. How can you solve a rational equation?

4. Use the method in either Exploration 1 or 2 to solve each equation.

a. $\frac{x+1}{x-1} = \frac{x-1}{x+1}$ **b.** $\frac{1}{x+1} = \frac{1}{x^2+1}$ **c.** $\frac{1}{x^2-1} = \frac{1}{x-1}$

Name _____ Date _____

7.5 Notetaking with Vocabulary

For use after Lesson 7.5

In your own words, write the meaning of each vocabulary term.

cross multiplying

Notes:

Name_____ Date _____

7.5 Notetaking with Vocabulary (continued)

Extra Practice

In Exercises 1–4, solve the equation by cross multiplying. Check your solution(s).

1. $\frac{2}{x+8} = \frac{5}{2x-7}$

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

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

4. $\frac{-2}{x-3} = \frac{x+9}{x+21}$

In Exercises 5–12, solve the equation by using the LCD. Check your solution(s).

5. $\frac{4}{7} - \frac{1}{x} = 6$

6. $\frac{3}{x+1} + \frac{4}{x+2} = \frac{15}{x+2}$

7. $\frac{12}{x+4} - \frac{7}{x} = \frac{22}{x^2+4x}$

8. $3 - \frac{18}{x-1} = -\frac{12}{x}$

Name _____ Date _____

7.5 Notetaking with Vocabulary (continued)

9. $\frac{2}{x-5} + \frac{3}{x} = \frac{10}{x^2 - 5x}$

10. $\frac{x+6}{x-4} - \frac{30}{x^2 - 5x + 4} = \frac{3}{x-1}$

11. $\frac{x}{x-5} + \frac{2}{x+2} = \frac{11}{x^2 - 3x - 10}$

12. $\frac{x-2}{x-4} - \frac{2}{x-1} = \frac{12}{x^2 - 5x + 4}$

In Exercises 13 and 14, determine whether the inverse of *f* is a function. Then find the inverse.

13. $f(x) = \frac{8}{x-3}$

14. $f(x) = \frac{12}{x} + 9$

15. You can complete the yard work at your friend's home in 5 hours. Working together, you and your friend can complete the yard work in 3 hours. How long would it take your friend to complete the yard work when working alone?

Let t be the time (in hours) your friend would take to complete the yard work when working alone.

	Work Rate	Time	Work Done
You	$\frac{1 \text{ yard}}{5 \text{ hours}}$	3 hours	
Friend		3 hours	