NAME _____ DATE _____

15-6 Solving Rational Equations (Pages 668–673)

A **rational equation** is an equation that contains at least one rational expression. There are three steps in solving rational equations.

Step 1 Find the LCD of each term.
Step 2 Multiply each side of the equation by the LCD.
Step 3 Use the Distributive Property to simplify.

EXAMPLE

Solve $\frac{a}{a+1} + \frac{3a}{a+1} = 3$.

$\frac{a}{a+1} + \frac{3a}{a+1} = 3$ *The LCD is a + 1.*

$(a+1)\left(\frac{a}{a+1} + \frac{3a}{a+1}\right) = (a+1)3$ *Multiply each side by the LCD.*

$(a+1)\frac{a}{a+1} + (a+1)\frac{3a}{a+1} = (a+1)3$ *Use the Distributive Property.*

$a + 3a = 3a + 3$

$4a = 3a + 3$

$a = 3$ *Subtract 3a from each side*

Check: $\frac{a}{a+1} + \frac{3a}{a+1} = 3$

$\frac{3}{4} + \frac{9}{4} \stackrel{?}{=} 3$ *Replace a with 3.*

$\frac{12}{4} \stackrel{?}{=} 3$

$3 = 3$ ✓

PRACTICE

Solve each equation. Check your solution.

1. $\frac{2}{3y} + \frac{4}{y} = \frac{1}{3}$

2. $\frac{n-4}{n} = \frac{5}{n}$

3. $\frac{14}{x} - 4 = \frac{6}{x}$

4. $\frac{1}{t} = \frac{3}{t-6}$

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

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

7. $\frac{k+8}{k} - \frac{k-4}{k} = 3$

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

9. $\frac{n}{n-1} + \frac{2n}{n-1} = 2$

10. $\frac{6}{b-7} + \frac{7}{b} = \frac{6}{b}$

11. $\frac{5}{c+4} - \frac{2}{c} = \frac{1}{c}$

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

13. $\frac{1}{3p} - \frac{2}{p-2} = -\frac{3}{p}$

14. $\frac{5}{y+5} + \frac{2}{y} = \frac{2}{y+5}$

15. $\frac{n-1}{n} = \frac{n+1}{n+3}$

16. **Standardized Test Practice** Solve $\frac{3}{2j} - \frac{4}{3j} = \frac{1}{3}$.

A -1 **B** $-\frac{1}{2}$ **C** $\frac{1}{2}$ **D** $\frac{1}{6}$

Answers: 1. 14 2. 9 3. 2 4. −3 5. 5 6. −4 7. 4 8. −1 9. −2 10. 1 11. 6 12. $-\frac{2}{5}$ 13. 5 14. −2 15. 3 16. C