Exercise Set A

MM1A3d Solve simple rational equations that result in linear equations or quadratic equations with leading coefficient of 1.

Solve the equation. Check your solution.

1. $\dfrac{x}{27} = \dfrac{3}{x}$

2. $\dfrac{3}{x} = \dfrac{2}{x + 4}$

3. $\dfrac{4}{x - 7} = \dfrac{2}{x}$

4. $\dfrac{10}{x + 2} = \dfrac{7}{x - 4}$

5. $\dfrac{-5}{x + 4} = \dfrac{x}{x + 4}$

6. $\dfrac{8}{x + 8} = \dfrac{x}{x + 2}$

7. $\dfrac{-1}{x + 2} = \dfrac{x}{x + 2}$

8. $\dfrac{2}{x} = \dfrac{x + 1}{2x + 5}$

9. $\dfrac{x - 3}{x + 2} = \dfrac{-2}{x + 2}$

Find the LCD of the rational expressions in the equation.

10. $\dfrac{7x}{x - 3} + 4 = \dfrac{x + 1}{x - 3}$

11. $\dfrac{3}{2x - 2} + 4 = \dfrac{7x}{x - 1}$

12. $\dfrac{7}{x - 2} + 1 = \dfrac{4}{x - 3}$

Solve the equation. Check your solution.

13. $\dfrac{2x}{x + 4} - 3 = \dfrac{-12}{x + 4}$

14. $\dfrac{3}{x + 2} + 5 = \dfrac{4}{x + 2}$

15. $\dfrac{2x}{x - 1} - 2 = \dfrac{10}{x + 2}$

16. Stain Mixing You are staining a coffee table you just made. After testing some sample pieces of wood, you decide that you want a mix of a yellow stain and a red stain. You estimate that you want a mix that contains 75% of the yellow stain. You only have 1 pint that is made up of equal parts of the two stains. How many pints of the yellow stain do you have to add to the current mixture?

17. Wallpaper Working together, an expert wallpaper hanger and an assistant can hang the wallpaper in a room in 3 hours. The assistant can hang the wallpaper in one and one-half times the time it takes the expert wallpaper hanger to hang the wallpaper alone. Let x represent the time (in hours) that the assistant can hang the wallpaper alone.

a. Copy and complete the table.

Person	Fraction of room papered each hour	Time (hours)	Fraction of room papered
Assistant	$\dfrac{1}{x}$	3	?
Expert	?	3	?

b. *Explain* why the sum of the expressions in the last column must be 1.

c. Write a rational equation that you can use to find the amount of time it takes the assistant to wallpaper the room alone. Then solve the equation.

LESSON 3.11

Exercise Set B

MM1A3d Solve simple rational equations that result in linear equations or quadratic equations with leading coefficient of 1.

Solve the equation. Check your solution.

1. $\dfrac{14}{2-x} = \dfrac{2}{x}$

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

3. $\dfrac{2}{x-4} + 2 = \dfrac{6}{x-4}$

4. $\dfrac{10}{x+2} = \dfrac{4}{x-1}$

5. $\dfrac{3x+2}{3x-5} = \dfrac{x}{x-1}$

6. $\dfrac{8}{x-4} = \dfrac{2}{x-2}$

7. $\dfrac{1}{3x} + \dfrac{1}{x+4} = \dfrac{1}{3}$

8. $\dfrac{x}{x-5} + 3 = \dfrac{4x-3}{x-4}$

9. $\dfrac{7}{x-2} - \dfrac{4}{x+2} = \dfrac{3}{x^2-4}$

10. $\dfrac{2x+3}{x+2} + 3x = \dfrac{-2}{x+2}$

11. $\dfrac{2}{x+3} - \dfrac{6}{2x+6} = \dfrac{x}{2}$

12. $\dfrac{5}{2x-2} = \dfrac{3}{x-1} + \dfrac{x+3}{8}$

13. $1 - \dfrac{x-1}{(x+1)^2} = \dfrac{1}{x+1}$

14. $2x + \dfrac{3x-4}{x-2} = \dfrac{2}{x-2}$

15. $\dfrac{x+2}{x-4} - \dfrac{2x}{x-1} = \dfrac{18}{x^2-5x+4}$

16. Let a and b be real numbers. The solutions of the equation $ax + b = \dfrac{24}{x+3} - 1$ are -9 and 9. What are the values of a and b?

17. **Paint Mixing** You have a 6-pint mixture of paint that is made up of equal amounts of red paint and yellow paint. To create a certain shade of orange, you need a paint mixture that is 30% red. How many pints of yellow paint do you need to add to the mixture?

18. **Roofing** Working together, an expert roofer and an assistant can complete the roof on a certain building in 24 hours. The expert roofer can roof the building alone in about three fifths of the time it takes the assistant to roof the building alone. Let x represent the time (in hours) that the expert can roof the building alone.

a. Copy and complete the table.

Person	Fraction of roof completed each hour	Time (hours)	Fraction of roof completed
Expert	$\dfrac{1}{x}$	24	?
Assistant	?	24	?

b. *Explain* why the sum of the expressions in the last column must be 1.

c. Write a rational equation that you can use to find the time that the expert can roof the building alone. Then solve the equation.

d. How long does it take the assistant to roof the building alone?

UNIT 3