

**Challenge: Skills and Applications**

For use with pages 154–159

**For Exercises 1–6, solve the equation.**

1.  $7 + \frac{2}{3}y = \frac{1}{6}y - 5$

2.  $2 + \frac{4}{3}n = 11 - \frac{1}{6}n$

3.  $\frac{1}{2}(r + 1) = \frac{2}{7}(r + 14)$

4.  $-\frac{2}{3}h + 14 = h - 6$

5.  $\frac{1}{2}(4x - 5) - \frac{1}{2} = \frac{2}{3}(3x - 6)$

6.  $\frac{3}{4}(\frac{8}{3}x - 8) - 3 = \frac{1}{2}(4x + 6)$

**For Exercises 7–9, solve the equation.**

**Example:**  $\frac{5}{2x} + 3 = \frac{7}{x}$

**Solution:** Multiply each side by  $x$ :  $x\left(\frac{5}{2x} + 3\right) = x\left(\frac{7}{x}\right)$ 

$$\frac{5}{2} + 3x = 7$$

$$\frac{5}{2} + 3x - \frac{5}{2} = 7 - \frac{5}{2}$$

$$3x = \frac{9}{2}$$

$$x = \frac{3}{2}$$

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

8.  $6 - \frac{5}{x} = \frac{1}{2x}$

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

**For Exercises 10–13, use the following information.**

His new employer has offered Malcolm Davis a choice of profit-sharing plans. He can receive  $\frac{1}{90}$  of the company's gross income or he can receive  $\frac{1}{60}$  of the company's profit. Gross income is the total amount the company takes in. Profit is the income that is left after the expenses have been subtracted off. The company's expenses for one month are \$100,000.

10. Use a verbal model to write an equation for finding the gross income that would give Malcolm Davis the same amount of money with either plan.
11. Solve the equation from Exercise 10 and interpret the solution.
12. How much would Malcolm Davis receive when the two plans are the same?
13. If the gross income of the company is less than the amount from Exercise 11, which plan would be better for Malcolm Davis?