a. $\frac{1}{5}x = 12$

b. $-\frac{2}{9}d = 4$

c. $15 = \frac{5}{3}n$

d. $-24 = -\frac{6}{7}p$

solve for the variable!

$$\frac{5}{1} \cdot \frac{1}{5} x = 12 \cdot \frac{5}{1}$$

$$x = 60$$

a. $\frac{1}{5}x = 12$

b. $-\frac{2}{9}d = 4$

c. $15 = \frac{5}{3}n$

d. $-24 = -\frac{6}{7}p$

"balance"

$$-\frac{2}{9}d = \frac{4}{1}\left(\frac{-9}{2}\right)$$

$$d = -18$$

a. $\frac{1}{5}x = 12$

b. $-\frac{2}{9}d = 4$

c. $15 = \frac{5}{3}n$

d. $-24 = -\frac{6}{7}p$

(d) $\left(-\frac{7}{6}\right)\frac{-24}{1} = -\frac{6}{7}p\left(-\frac{7}{6}\right)$

$28 = p$

Guided Practice

Check

Solve each equation. Check your solution. (Examples 1–3)

1. $60 = \frac{3}{4}p$ **80**

2. $-\frac{27}{25}x = -\frac{9}{5}$ **$\frac{5}{3}$ or $1\frac{2}{3}$**

3. $-2.7t = 810$ **-300**

Show your work.

4. Paula has read 70% of the total pages in a book she is reading for English class. Paula has read 84 pages. Define a variable. Then write and solve an equation to determine how many pages are in the book. (Example 4)

p = total pages in book; $0.7p = 84$; 120 pages

Rate Yourself!

Are you ready to move on? Shade the section that applies.

4. Paula has read 70% of the total pages in a book she is reading for English class. Paula has read 84 pages. Define a variable. Then write and solve an equation to determine how many pages are in the book. (Example 4)

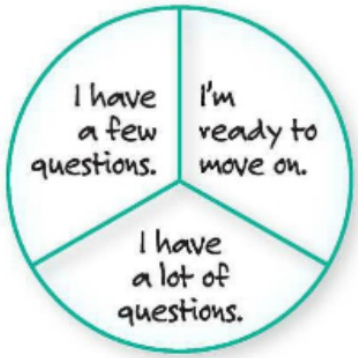
p = total pages in book; $0.7p = 84$; 120 pages

5. **Building on the Essential Question** How is the multiplicative inverse used to solve an equation that has a rational coefficient?

To solve an equation with a coefficient that is a fraction, multiply each side of the equation by the multiplicative inverse of the fraction.

Rate Yourself!

Are you ready to move on? Shade the section that applies.



For more help, go online to access a Personal Tutor.

Tutor

Independent Practice

Go online for Step-by-Step Solutions

Solve each equation. Check your solution. (Examples 1–3)

1. $6 = \frac{1}{12}v$ **72**

Show your work.

2. $-\frac{2}{3}w = 60$ **−90**

3 $-\frac{7}{8}k = -21$ **24**

4. $9.6 = 1.2b$ **8**

5. $0.75a = -9$ **−12**

6. $-413.4 = -15.9n$ **26**

7. $3\frac{1}{10}s = 6\frac{1}{5}$ **2**

8. $2\frac{2}{9} = -\frac{4}{5}m$ $-\frac{25}{9}$ or $-2\frac{7}{9}$

9. $-2\frac{4}{5} = -3\frac{1}{2}n$ $\frac{4}{5}$

Define a variable. Then write and solve an equation for each situation. (Example 4)

10. The Parker family drove a total of 180 miles on their road trip. This distance is 1.5 times the distance they drove on the first day. How many miles did the Parker family drive on the first day?

***d* = miles on first day; 1.5*d* = 180; 120 mi**

11 José correctly answered 80% of the questions on a language arts quiz. If he answered 16 questions correctly, how many questions were on the language arts quiz?

***q* = total questions; 0.8*q* = 16; 20 questions**

12. Financial Literacy Demitrius deposited 60% of his paycheck into his savings account. What was the amount of his paycheck?

***a* = amount of paycheck; 0.60*a* = 41.67; $69.45**

Multiplicative Inverse

$1\frac{1}{3}$ $-\frac{1}{2}$

Division

0.2 -5

H.O.T. Problems Higher Order Thinking

14. MP Model with Mathematics Write a real-world problem that can be represented by the equation $\frac{3}{4}c = 21$. Sample answer: Three fourths of the students in Abdul's homeroom study Spanish. Twenty-one students in his homeroom study Spanish. How many students are in Abdul's homeroom?

MP Persevere with Problems Determine whether each statement is *true* or *false*. Explain your reasoning.

15. The product of a fraction and its multiplicative inverse is 1.
true; Sample answer: The product of $\frac{3}{4}$ and $\frac{4}{3}$ is $\frac{12}{12}$, which simplifies to 1.

16. To solve an equation with a coefficient that is a fraction, divide each side of the equation by the reciprocal of the fraction. **false; Sample answer: You would multiply, not divide, by the reciprocal of the fraction. For example, to solve $\frac{2}{3}x = 20$, multiply each side by $\frac{3}{2}$.**

17. MP **Reason Inductively** Complete the statement: If $10 = \frac{1}{5}x$, then $x + 3 =$ ▮. Explain your reasoning. **53; Since $10 = \frac{1}{5}x$, then $x = 50$ and $x + 3 = 53$.**

18. MP **Justify Conclusions** Suppose your friend says he can solve $3x = 15$ by using the Multiplication Property of Equality. Is he correct? Justify your response. **Sample answer: Yes; he can multiply each side of the equation by $\frac{1}{3}$ instead of dividing by 3.**