

5.4

Solving a Linear Equation: Problem Type 2

• Example 1

(a) Solve

$$\frac{x}{5} - 3 = 4$$

To isolate the x term, we first add 3 to both sides.

$$\begin{aligned}\frac{x}{5} - 3 + 3 &= 4 + 3 \\ \frac{x}{5} &= 7\end{aligned}$$

Multiply both sides of the equation by 5, to get

$$\begin{aligned}5 \cdot \left(\frac{x}{5}\right) &= 5 \cdot 7 \\ x &= 35\end{aligned}$$

The solution is 35. Just return to the original equation to check the result.

$$\begin{aligned}\frac{35}{5} - 3 &= 4 \\ 7 - 3 &= 4 \\ 4 &= 4\end{aligned}$$

(b) Solve

$$\frac{2}{3}x + 5 = 13$$

$$\begin{aligned}\frac{2}{3}x + 5 - 5 &= 13 - 5 && \text{First subtract 5 from both sides.} \\ \frac{2}{3}x &= 8\end{aligned}$$

Now multiply both sides by $\frac{3}{2}$, the reciprocal of $\frac{2}{3}$.

$$\frac{3}{2} \cdot \frac{2}{3}x = \frac{3}{2} \cdot 8$$

or

$$x = 12$$

The solution is 12. We'll leave it to you to check this result.

● ● ● CHECK YOURSELF 1

Solve and check.

a. $\frac{x}{6} + 5 = 3$

b. $\frac{3}{4}x - 8 = 10$

● ● ● CHECK YOURSELF ANSWER

1. (a) -12 ; (b) 24 .

5.4 Exercises

Name _____

Section _____

Date _____

Solve for x and check your result.

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

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

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

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

5. $\frac{2}{3}x + 5 = 17$

6. $\frac{3}{4}x - 5 = 4$

7. $\frac{4}{5}x - 3 = 13$

8. $\frac{5}{7}x + 4 = 14$

9. $\frac{x}{3} - 5 = 1$

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

11. $\frac{5}{6}x + 8 = 18$

12. $\frac{x}{7} + 12 = 14$

A N S W E R S

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

9. _____

10. _____

11. _____

12. _____