



## Solving a Linear Equation: Problem Type 1

### • Example 1

(a) Solve

$$4x - 5 = 7$$

By successive operations on both sides, we transform this equation into equivalent equations, the last one being  $x = 3$ , which is the solution of  $4x - 5 = 7$ . The explanation for each step is shown in parentheses.

$$4x - 5 = 7$$

$$4x - 5 + 5 = 7 + 5 \quad (\text{Adding } 5 \text{ on both sides})$$

$$4x = 12 \quad (\text{Simplifying})$$

$$\frac{1}{4} \cdot 4x = \frac{1}{4} \cdot 12 \quad \left( \text{Multiplying by } \frac{1}{4} \text{ on both sides} \right)$$

$$x = 3 \quad (\text{Simplifying})$$

The solution is 3. To check, replace  $x$  with 3 in the original equation:

$$4 \cdot 3 - 5 = 7$$

That is,

$$7 = 7.$$

(b) Solve

$$3x + 8 = -4$$

$$3x + 8 - 8 = -4 - 8 \quad (\text{Subtracting } 8 \text{ from both sides})$$

$$3x = -12 \quad (\text{Simplifying})$$

Now divide both sides by 3 to isolate  $x$  on the left.

$$\frac{3x}{3} = \frac{-12}{3}$$

$$x = -4$$

The solution is  $-4$ . We'll leave the check of this result to you.

● ● ● CHECK YOURSELF 1

Solve and check.

a.  $6x + 9 = -15$

b.  $5x - 8 = 7$

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● ● ● CHECK YOURSELF ANSWER

1. (a)  $-4$ ; (b)  $3$ .

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# 2.6 Exercises

Name \_\_\_\_\_

Section \_\_\_\_\_

Date \_\_\_\_\_

Solve for  $x$  and check your result.

1.  $2x + 1 = 9$

2.  $3x - 1 = 17$

3.  $3x - 2 = 7$

4.  $5x + 3 = 23$

5.  $4x + 7 = 35$

6.  $7x - 8 = 13$

7.  $2x + 9 = 5$

8.  $6x + 25 = -5$

9.  $7x - 5 = 16$

10.  $10 - 3x = -2$

11.  $8x + 9 = 41$

12.  $12 + 5x = 37$

## A N S W E R S

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_

5. \_\_\_\_\_

6. \_\_\_\_\_

7. \_\_\_\_\_

8. \_\_\_\_\_

9. \_\_\_\_\_

10. \_\_\_\_\_

11. \_\_\_\_\_

12. \_\_\_\_\_