## Decimal Operations and Equations with Decimals

Goal: Solve equations involving decimals.

## Example 1 Adding and Subtracting Decimals

a. Find the sum $-1.7+(-3.4)$.

Use the rule for adding numbers with the same sign. Add
$\square$ and $\square$. Both decimals are $\square$, so the
sum is $\square$

$$
-1.7+(-3.4)=\square
$$

b. Find the difference $-21.29-(-34.62)$.

First rewrite the difference as a sum: $-21.29+34.62$. Then use the rule for adding numbers with different signs. Subtract $\mid \square$ from $|\square|>\mid \square$, so the sum has the same sign as $\square$.
$-21.29-(-34.62)=\square$

Checkpoint Find the sum or difference.

| 1. $-2.8+(-5.9)$ | 2. $7.12-(-3.46)$ |
| :--- | :--- |
|  |  |

You can use estimation to check the results of operations with decimals. For instance, notice that $-29.07 \div(-1.9)$ $=15.3$ is about $-30 \div(-2)$, or 15 . So, an answer of 15.3 is reasonable.
a. $-0.4(13.7)=\square$
b. $-2.5(-6.75)=$ $\square$
c. $-23.49 \div(-2.9)=\square$
$\square$

Different signs: Product is $\square$.
Same signs: Product is
$\square$
Same signs: Quotient is
$\square$
d. $18.05 \div(-1.9)=\square$

Different signs: Quotient is
$\square$

## Checkpoint Find the product or quotient.

3. $-2.8(-5.9)$
4. $7.093 \div(-3.46)$

## Example 3 Solving Addition and Subtraction Equations

Solve the equation.
a. $x+6.3=4.8$
b. $y-5.74=-3.51$

## Solution

a.

$$
\begin{array}{rlrl}
x+6.3 & =4.8 & & \text { Write original equation. } \\
x+6.3-\square & =4.8-\square & & \text { Subtract } \square \\
x & =\square \text { from each side. } \\
x & & \text { Simplify. }
\end{array}
$$

b.

$$
\begin{array}{rlrl}
y-5.74 & =-3.51 & & \text { Write original equation. } \\
y-5.74+\square & =-3.51+\square & & \text { Add } \square \\
y & =\square \text { to each side. } \\
& & \text { Simplify. }
\end{array}
$$

Checkpoint Solve the equation. Check your solution.

| 5. $x+5.6=9.4$ | $6 .-3.5=y+1.2$ | 7. $m-5.3=-7.2$ |
| :--- | :--- | :--- |
|  |  |  |

## Example 4 Solving Multiplication and Division Equations

Solve the equation.
a. $0.8 m=4.8$
b. $\frac{n}{5}=-2.15$

## Solution

a. $0.8 m=4.8 \quad$ Write original equation.
$\frac{0.8 m}{\square}=\frac{4.8}{\square} \quad$ Divide each side by $\square$.

$$
m=\square
$$

Simplify.
b. $\quad \frac{n}{5}=-2.15 \quad$ Write original equation.

$$
\begin{aligned}
\square\left(\frac{n}{5}\right) & =\square(-2.15) \quad \text { Multiply each side by } \square . \\
n & =\square \quad \text { Simplify. }
\end{aligned}
$$

Checkpoint Solve the equation. Check your solution.
$\square$
8. $6 x=-43.2$
9. $\frac{y}{-3.1}=-8.4$

