Solving Equations Containing Integers

Warm Up

Problem of the Day

Lesson Presentation

Lesson Quizzes

Solving Equations Containing Integers

Warm Up

Use mental math to find each solution.

1. $7 + y = 15$ $y = 8$

2. $x \div 9 = 9$ $x = 81$

3. $6x = 24$ $x = 4$

4. $x - 12 = 30$ $x = 42$

Solving Equations Containing Integers

Problem of the Day

Zelda sold her wet suit to a friend for $156. She sold her tank, mask, and snorkel for $85 less than she sold her wet suit. She bought a used wet suit for $80 and a used tank, mask, and snorkel for $36. If she started with $0, how much money does she have left?

$111

Solving Equations Containing Integers

Learn to solve one-step equations with integers.

Solving Equations Containing Integers

Inverse Property of Addition		
Words	Numbers	Algebra
The sum of a number and its opposite, or additive inverse, is 0.	3 + (–3) = 0	a + (–a) = 0

Additional Example 1A: Solving Addition and Subtraction Equations

Solve each question. Check each answer.

$-6 + x = -7$

$-6 + x = -7$

$+6 \qquad +6$

$x = -1$

Add 6 to both sides to isolate the variable.

Check

$-6 + x = -7$

$-6 + (-1) \stackrel{?}{=} -7$

Substitute –1 for x.

$-7 \stackrel{?}{=} -7$ ✓

True.

Additional Example 1B: Solving Addition and Subtraction Equations

Solve each equation. Check each answer.

***p* + 5 = –3**

$p + 5 = -3$

$+ (-5) \quad +(-5)$

Add –5 to both sides.

$p = -8$

Check

$p + 5 = -3$

$-8 + 5 \stackrel{?}{=} -3$

Substitute –8 for p.

$-3 \stackrel{?}{=} -3$ ✓

True.

Additional Example 1C: Solving Addition and Subtraction Equations

Solve each equation. Check each answer.

***y* – 9 = –40**

$y - 9 = -40$

$+9 \quad +9$

Add 9 to both sides.

$y = -31$

Check

$y - 9 = -40$

$-31 - 9 \stackrel{?}{=} -40$ *Substitute –31 for y.*

$-40 \stackrel{?}{=} -40$ ✓ *True.*

Check It Out: Example 1A

Solve each equation. Check each answer.

$-3 + x = -9$

$-3 + x = -9$

$+3 \qquad +3$

Add 3 to both sides.

$x = -6$

Check

$-3 + x = -9$

$-3 + (-6) \stackrel{?}{=} -9$ *Substitute –6 for x.*

$-9 \stackrel{?}{=} -9$ ✓ *True.*

Check It Out: Example 1B

Solve each equation. Check each answer.

$q + 2 = -6$

$q + 2 = -6$

$+(-2) \quad +(-2)$ *Add –2 to both sides.*

$q = -8$

Check

$q + 2 = -6$

$-8 + 2 \stackrel{?}{=} -6$ *Substitute –8 for q.*

$-6 \stackrel{?}{=} -6$ ✓ *True.*

Check It Out: Example 1C

Solve each equation. Check each answer.

***y* – 7 = –34**

$y - 7 = -34$

$+7 \quad +7$ *Add 7 to both sides.*

$y = -27$

Check

$y - 7 = -34$

$-27 - 7 \stackrel{?}{=} -34$ *Substitute –27 for y.*

$-34 \stackrel{?}{=} -34$ ✓ *True.*

Additional Example 2A: Solving Multiplication and Division Equations

Solve each equation. Check each answer.

$$\frac{b}{-5} = 6$$

$$\frac{b}{-5} = 6$$

$$(-5)\left(\frac{b}{-5}\right) = (-5)6$$ *Multiply both sides by –5.*

$$b = -30$$

Additional Example 2A Continued

Check

$$\frac{b}{-5} = 6$$

$$\frac{-30}{-5} \stackrel{?}{=} 6$$

Substitute –30 for b.

$$6 = 6 \quad ✓$$

True.

$\frac{b}{-5} = 6.$

Additional Example 2B: Solving Multiplication and Division Equations

Solve each equation. Check each answer.

$-400 = 8y$

$-400 = 8y$

$\frac{-400}{8} = \frac{8y}{8}$

Divide both sides by 8.

$-50 = y$

Additional Example 2B: Solving Multiplication and Division Equations

Check

$-400 = 8y$ *Substitute –50 for y.*

$-400 \stackrel{?}{=} 8(-50)$

$-400 = -400$ ✓ *True.*

Solving Equations Containing Integers

Check It Out: Example 2A

Solve each equation. Check each answer.

$$\frac{c}{4} = -24$$

$$\frac{c}{4} = -24$$

$$4\left(\frac{c}{4}\right) = 4(-24)$$ *Multiply both sides by 4.*

$$c = -96$$

Check It Out: Example 2A Continued

Check

$$\frac{c}{4} = -24$$

$$\frac{-96}{4} \stackrel{?}{=} -24$$ *Substitute –96 for c.*

$$-24 = -24$$ ✓ *True.*

$$\frac{c}{4} = -24.$$

Check It Out: Example 2B

Solve each equation. Check each answer.

$-200 = 4x$

$-200 = 4x$

$\frac{-200}{4} = \frac{4x}{4}$

Divide both sides by 4.

$-50 = x$

Check It Out: Example 2B Continued

Check.

$-200 = 4x$ *Substitute –50 for x.*

$-200 \stackrel{?}{=} 4(-50)$

$-200 = -200$ ✓ *True.*

Additional Example 3: *Business Application*

In 2003, a manufacturer made a profit of $300 million. This amount was $100 million more than the profit in 2002. What was the profit in 2002?

Let p represent the profit in 2002 (in millions of dollars).

This year's profit	is	100 million more than	Last year's profit
300	=	100 +	p

$$300 = 100 + p$$
$$-100 \quad -100$$
$$200 = p$$

The profit was $200 million in 2002.

Solving Equations Containing Integers

Check It Out: Example 3

This year the class bake sale made a profit of $243. This was an increase of $125 over last year. How much did they make last year?

Let x represent the money they made last year.

This year's profit	is =	125 million	More than	Last year's profit
243		125	+	x

$$243 = 125 + x$$
$$-125 \quad -125$$
$$118 = x$$

The class earned $118 last year.

Lesson Quizzes

Standard Lesson Quiz

Lesson Quiz for Student Response Systems

Solving Equations Containing Integers

Lesson Quiz

Solve each equation. Check your answer.

1. $-8y = -800$ 100

2. $x - 22 = -18$ 4

3. $-\frac{y}{7} = 7$ –49

4. $w + 72 = -21$ –93

5. Last year a phone company had a loss of $25 million. This year the loss is $14 million more last year. What is this years loss? $39 million

Lesson Quiz for Student Response Systems

1. Solve the equation.

$y + 65 = -20$

A. $y = 45$

B. $y = 85$

C. $y = -45$

D. $y = -85$

Lesson Quiz for Student Response Systems

2. Solve the equation.

$x - 25 = -15$

A. $x = 10$

B. $x = 20$

C. $x = 35$

D. $x = 45$

Lesson Quiz for Student Response Systems

3. Solve the equation.

$-10y = -1000$

A. $y = -200$

B. $y = -100$

C. $y = 100$

D. $y = 200$

Solving Equations Containing Integers

Lesson Quiz for Student Response Systems

4. Solve the equation.

$$-\frac{a}{6} = \frac{9}{9}$$

A. $a = 54$

B. $a = 15$

C. $a = -15$

D. $a = -54$

Lesson Quiz for Student Response Systems

5. In an online test, Dick scored –34 points. This was 20 points less than his previous score. What was his previous score?

A. 54 points

B. 14 points

C. –14 points

D. –54 points