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

Essential Question:

How do you solve one-step equations with integers?

Standard:
MCC7.EE.4: Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations to solve problems by reasoning about quantities.

Solving Equations Containing Integers

Learn to solve one-step equations with integers.

Equation Song

Solving Equations

Fill in the tabs of the foldable as shown

Order of Operations

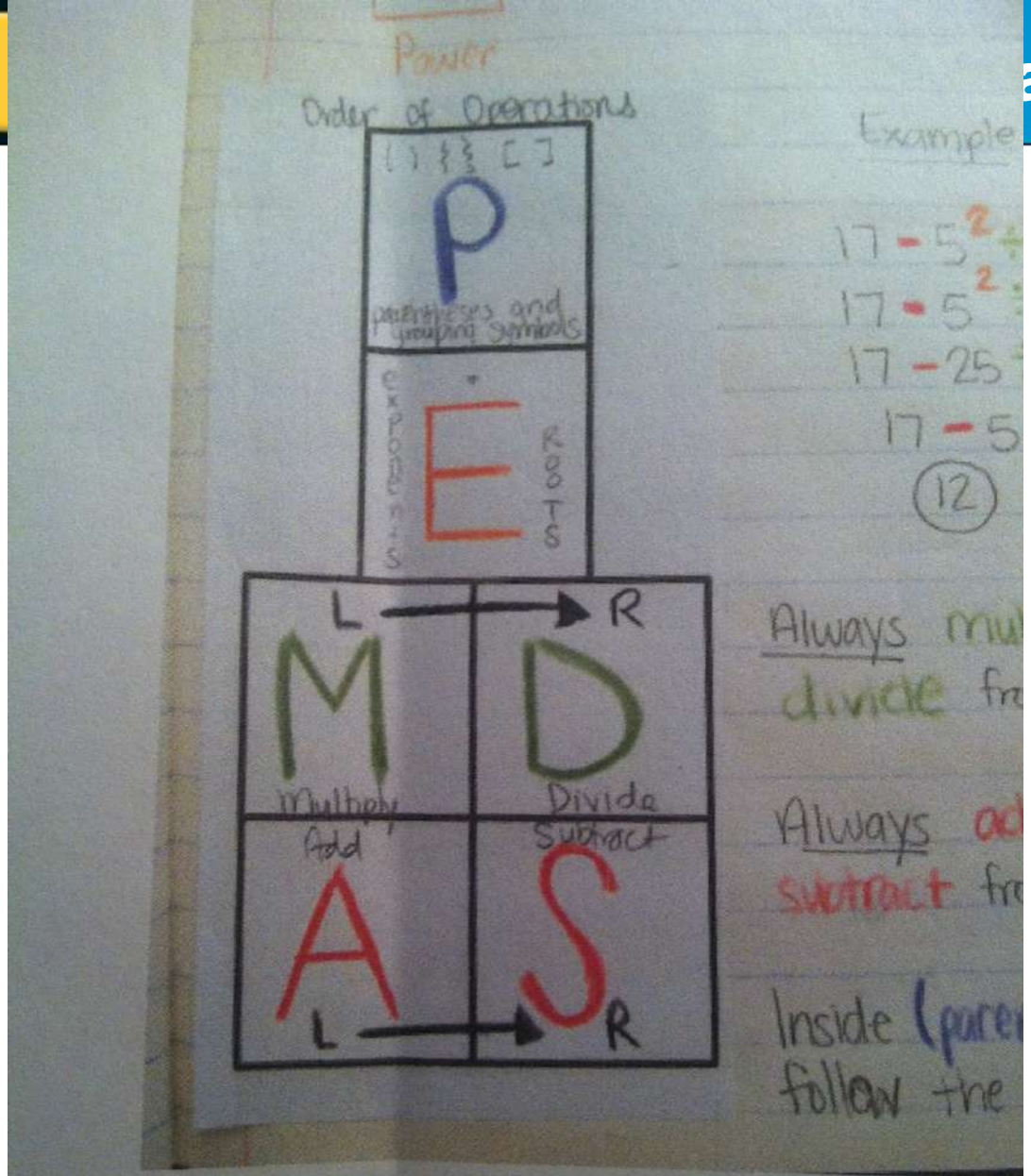
Inverse Operations

1-Step Text: 4-3, 4-4, 4-5

2-Step Text: 5-1

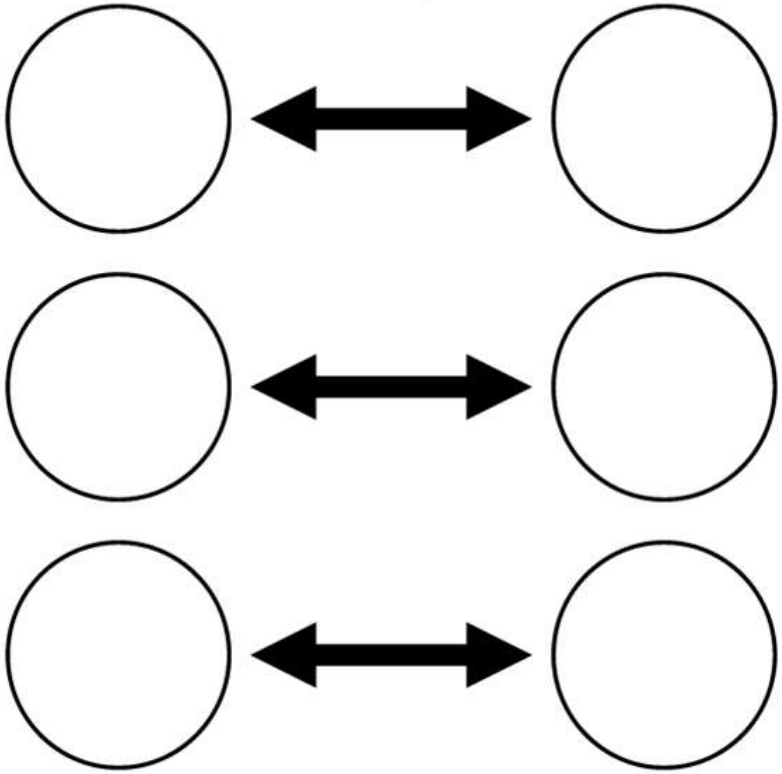
multi-Step Text: 5-3

aining Integers

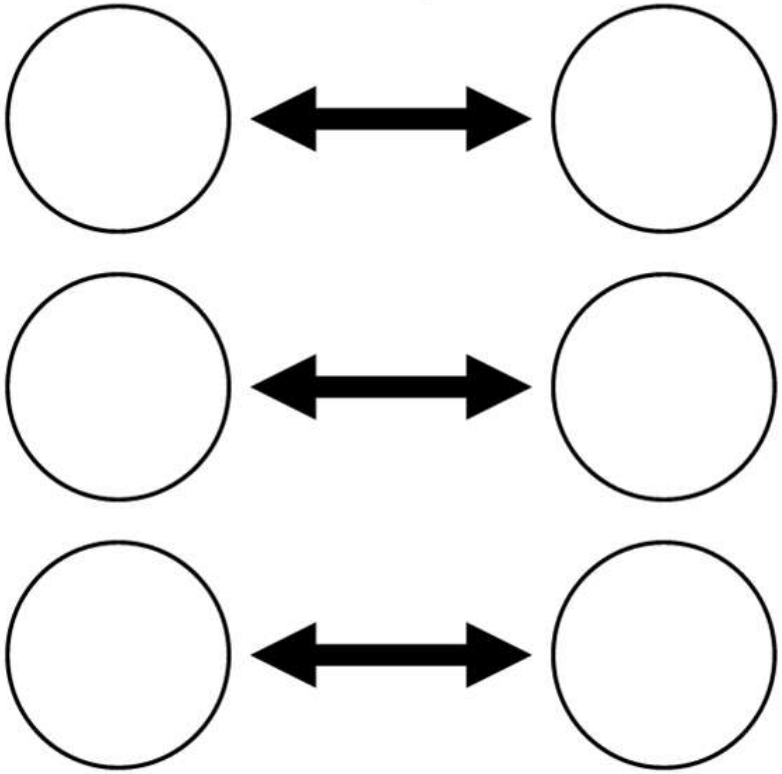


Copy this into the foldable.

Inverse Operations

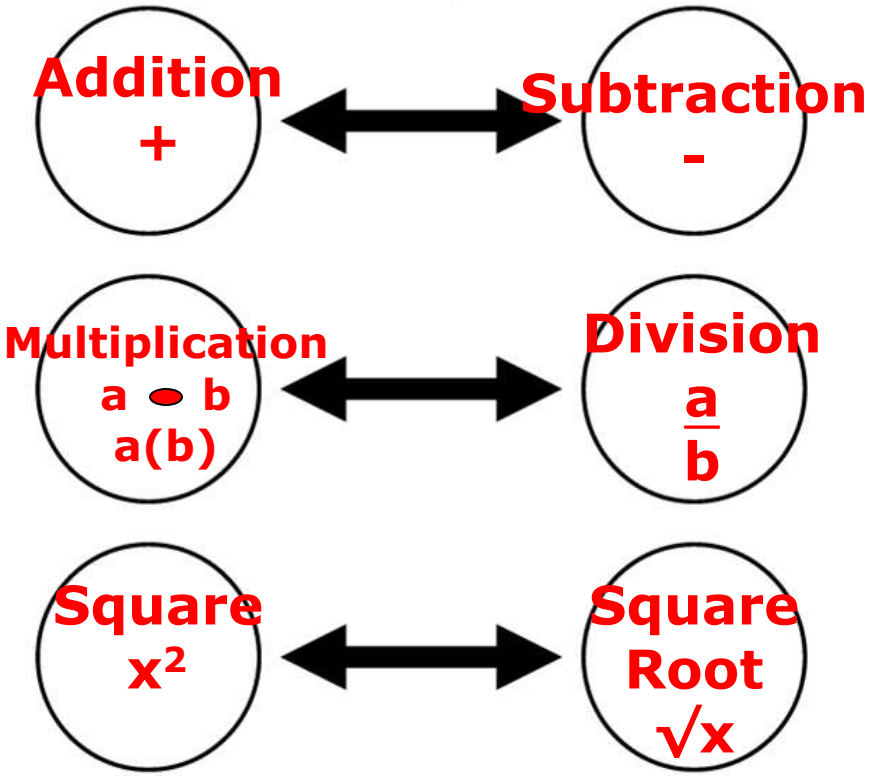


Inverse Operations



Operations that "undo" each other.

Inverse Operations



Addition

Positive # by itself

x + 3

3 + x

Subtraction

Term with a negative sign in front.

x – b

–b + x

Multiplication

and variable are side by side

bx

3x

Glue the graphic organizer into your notebook. Fill in the information as we go over it.

Solving Equations Containing Integers

Copy the following in the foldable for 1-Step Equations

Steps

1. Draw a line down the equation through the equal sign.
2. Identify the operation taking place.
3. Do the inverse (opposite) of that operation.
4. Do the same to the other side of the equation.

Solving Equations Containing Integers

This example goes in foldable

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.*

Solving Equations Containing Integers

A. Goes in the foldable B. Goes in Example section

Solve.

A. $n - 2.75 = 8.3$

$n - 2.75 = 8.30$

$+ 2.75 \quad + 2.75$

$n = 11.05$

Use the Addition Property of Equality. Add 2.75 to both sides.

B. $a + 32.66 = 42$

$a + 32.66 = 42.00$

$-32.66 \quad -32.66$

$a = 9.34$

Use the Subtraction Property of Equality. Subtract 32.66 from both sides.

Solving Equations Containing Integers

Goes in example section

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.*

Solving Equations Containing Integers

Goes in Foldable

Solve. Write the answer in simplest form.

$$\frac{4}{9} + r = \frac{-1}{2}$$

$$\frac{4}{9} + r = \frac{-1}{2}$$

$$\frac{4}{9} + r - \frac{4}{9} = \frac{-1}{2} - \frac{4}{9}$$

Use the Subtraction Property of Equality.

$$r = \frac{-9}{18} - \frac{8}{18}$$

Find a common denominator.

$$r = -\frac{17}{18}$$

Subtract.

Helpful Hint

You can also isolate the variable r by adding the opposite of $\frac{4}{9}$, $-\frac{4}{9}$, to both sides.

Solving Equations Containing Integers

Goes in the example section

Solve. Write the answer in simplest form.

$$\mathbf{x - \frac{3}{7} = \frac{5}{7}}$$

$$x - \frac{3}{7} = \frac{5}{7}$$

$$x - \frac{3}{7} + \frac{3}{7} = \frac{5}{7} + \frac{3}{7}$$

Use the Addition Property of Equality.

$$x = \frac{8}{7} = 1\frac{1}{7}$$

Add.

Solving Equations Containing Integers

Goes in example section

Solve. Write the answer in simplest form.

$$\mathbf{x - \frac{3}{8} = \frac{7}{8}}$$

$$x - \frac{3}{8} = \frac{7}{8}$$

$$x - \frac{3}{8} + \frac{3}{8} = \frac{7}{8} + \frac{3}{8}$$

Use the Addition Property of Equality.

$$x = \frac{10}{8} = 1\frac{1}{4}$$

Simplify.

Solving Equations Containing Integers

Goes in the foldable

Solve each equation. Check each answer.

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

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

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

$$b = -30$$

Solving Equations Containing Integers

Goes in example section

Solve.

$$\frac{x}{4.8} = 5.4$$

$$\frac{x}{4.8} = 5.4$$

$$\frac{x}{4.8} \cdot 4.8 = 5.4 \cdot 4.8$$

$$x = 25.92$$

Use the Multiplication Property of Equality. Multiply by 4.8 on both sides.

Solving Equations Containing Integers

Goes in example section

Solve.

$$\frac{x}{3.5} = 2.4$$

$$\frac{x}{3.5} = 2.4$$

$$\frac{x}{3.5} \cdot 3.5 = 2.4 \cdot 3.5$$

$$x = 8.4$$

Use the Multiplication Property of Equality. Multiply by 3.5 on both sides.

Solving Equations Containing Integers

Goes in example section

Solve each equation. Check each answer.

$-400 = 8y$

$$-400 = 8y$$

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

Divide both sides by 8.

$$-50 = y$$

Solving Equations Containing Integers

Goes in the foldable

Solve.

9 = 3.6d

$$9 = 3.6d$$

$$\frac{9}{3.6} = \frac{3.6d}{3.6}$$

Use the Division Property of Equality. Divide by 3.6 on both sides.

$$\frac{9}{3.6} = d$$

Think: 9 ÷ 3.6 = 90 ÷ 36

$$2.5 = d$$

Solving Equations Containing Integers

Goes in the foldable

Solve. Write the answer in simplest terms.

$$\frac{3}{8}x = \frac{1}{4}$$

$$\frac{3}{8}x = \frac{1}{4}$$

$$\frac{3}{8}x \cdot \frac{8}{3} = \frac{1}{4} \cdot \frac{\cancel{8}^{2}}{3}$$

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

Multiply by the reciprocal of $\frac{3}{8}$. Then simplify.

Caution!

To undo multiplying by $\frac{3}{8}$, you can divide by $\frac{3}{8}$ or multiply by its reciprocal, $\frac{8}{3}$.

Solving Equations Containing Integers

Goes in examples

Solve. Write the answer in simplest terms.

$$4x = \frac{8}{9}$$

$$4x = \frac{8}{9}$$

Multiply by the reciprocal of 4.

$$4x \cdot \frac{1}{4} = \frac{\cancel{8}^{2}}{9} \cdot \frac{1}{\cancel{4}_{1}}$$

Then simplify.

$$x = \frac{2}{9}$$

Solving Equations Containing Integers

Review Video

Class work:
Workbook Pg. 109, 115, 121
Choose four problems from each page. You must have one problem from each operation on each page. 1-addition, 1-subtraction, 1-multiplication, and 1-division