Unit 6, Lesson 4: Practice Solving Equations and Representing Situations with Equations

Let's solve equations by doing the same to each side.

4.1: Number Talk: Subtracting From Five

Find the value of each expression mentally.

$5 - 2$

$5 - 2.1$

$5 - 2.17$

$5 - 2\frac{7}{8}$

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4.2: Row Game: Solving Equations Practice

Solve the equations in one column. Your partner will work on the other column.

Check in with your partner after you finish each row. Your answers in each row should be the same. If your answers aren't the same, work together to find the error and correct it.

column A	column B
$18 = 2x$	$36 = 4x$
$17 = x + 9$	$13 = x + 5$
$8x = 56$	$3x = 21$
$21 = \frac{1}{4}x$	$28 = \frac{1}{3}x$
$6x = 45$	$8x = 60$
$x + 4\frac{5}{6} = 9$	$x + 3\frac{5}{6} = 8$
$\frac{5}{7}x = 55$	$\frac{3}{7}x = 33$
$\frac{1}{5} = 6x$	$\frac{1}{3} = 10x$
$2.17 + x = 5$	$6.17 + x = 9$
$\frac{20}{3} = \frac{10}{9}x$	$\frac{14}{5} = \frac{7}{15}x$
$14.88 + x = 17.05$	$3.91 + x = 6.08$
$3\frac{3}{4}x = 1\frac{1}{4}$	$\frac{7}{5}x = \frac{7}{15}$

4.3: Choosing Equations to Match Situations

- Circle **all** of the equations that describe each situation. If you get stuck, draw a diagram.
- Find the solution for each situation.

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1. Clare has 8 fewer books than Mai. If Mai has 26 books, how many books does Clare have?

   ○ $26 - x = 8$

   ○ $x = 26 + 8$

   ○ $x + 8 = 26$

   ○ $26 - 8 = x$

   $x =$ _____

2. A coach formed teams of 8 from all the players in a soccer league. There are 14 teams. How many players are in the league?

   ○ $y = 14 \div 8$

   ○ $\frac{y}{8} = 14$

   ○ $\frac{1}{8}y = 14$

   ○ $y = 14 \cdot 8$

   $y =$ _____

3. Kiran scored 223 more points in a computer game than Tyler. If Kiran scored 409 points, how many points did Tyler score?

   ○ $223 = 409 - z$

   ○ $409 - 223 = z$

   ○ $409 + 223 = z$

   ○ $409 = 223 + z$

   $z =$ _____

4. Mai ran 27 miles last week, which was three times as far as Jada ran. How far did Jada run?

   ○ $3w = 27$

   ○ $w = \frac{1}{3} \cdot 27$

   ○ $w = 27 \div 3$

   ○ $w = 3 \cdot 27$

   $w =$ _____

Are you ready for more?

Mai's mother was 28 when Mai was born. Mai is now 12 years old. In how many years will Mai's mother be twice Mai's age? How old will they be then?

Lesson 4 Summary

Writing and solving equations can help us answer questions about situations.

Suppose a scientist has 13.68 liters of acid and needs 16.05 liters for an experiment. How many more liters of acid does she need for the experiment?

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- We can represent this situation with the equation:

$$13.68 + x = 16.05$$

- When working with hangers, we saw that the solution can be found by subtracting 13.68 from each side. This gives us some new equations that also represent the situation:

$$x = 16.05 - 13.68$$
$$x = 2.37$$

- Finding a solution in this way leads to a variable on one side of the equal sign and a number on the other. We can easily read the solution—in this case, 2.37—from an equation with a letter on one side and a number on the other. We often write solutions in this way.

Let's say a food pantry takes a 54-pound bag of rice and splits it into portions that each weigh $\frac{3}{4}$ of a pound. How many portions can they make from this bag?

- We can represent this situation with the equation:

$$\frac{3}{4}x = 54$$

- We can find the value of x by dividing each side by $\frac{3}{4}$. This gives us some new equations that represent the same situation:

$$x = 54 \div \frac{3}{4}$$
$$x = 72$$

- The solution is 72 portions.

Unit 6, Lesson 4: Practice Solving Equations and Representing Situations with Equations

1. Select **all** the equations that describe each situation and then find the solution.

   a. Kiran's backpack weighs 3 pounds less than Clare's backpack. Clare's backpack weighs 14 pounds. How much does Kiran's backpack weigh?

       i. $x + 3 = 14$

       ii. $3x = 14$

       iii. $x = 14 - 3$

       iv. $x = 14 \div 3$

   b. Each notebook contains 60 sheets of paper. Andre has 5 notebooks. How many sheets of paper do Andre's notebooks contain?

       i. $y = 60 \div 5$

       ii. $y = 5 \cdot 60$

       iii. $\frac{y}{5} = 60$

       iv. $5y = 60$

2. Solve each equation.

   a. $2x = 5$

   b. $y + 1.8 = 14.7$

   c. $6 = \frac{1}{2}z$

   d. $3\frac{1}{4} = \frac{1}{2} + w$

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e. $2.5t = 10$

3. For each equation, draw a tape diagram that represents the equation.

a. $3x = 18$

b. $3 + x = 18$

c. $17 - 6 = x$

(from Unit 6, Lesson 1)

4. Find each product.

a. $(21.2) \cdot (0.02)$ b. $(2.05) \cdot (0.004)$

(from Unit 5, Lesson 8)

5. For a science experiment, students need to find 25% of 60 grams. Jada says, "I can find this by calculating $\frac{1}{4}$ of 60." Andre says, "25% of 60 means $\frac{25}{100} \cdot 60$." Lin says both of their methods work. Do you agree with Lin? Explain your reasoning.

(from Unit 3, Lesson 13)