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3.2

In Chapter 3, we’ll focus on problems where we know the output, but we don’t know one of the input numbers. Here’s an example:

Pairs or Small Groups

1). For a total of $21, you buy 4 songs online and get a $15 gift card. What is the cost of **each song**?



Gift card

$15

= $21

+

Whole-class discussion: Let’s compare methods of answering #1.

2). Now let’s write down those steps from #1 with equations instead of pictures.

3). You want to buy 5 tickets to a show, and you can spend up to $149. You have to pay a one-time processing fee of $11 plus the cost of each ticket. What’s the most you can spend per ticket? Please show your work in pictures and with an equation:

**Pictures** **Equation**

Pairs or individual: Practice on your own and check your work with the answers on the screen.

4). You are having pizzas delivered. How much is each pizza?



+

$4 delivery fee

= $31.75



Equation

Picture

Credits: The pizza is Microsoft clipart. The delivery guy is MS Office Online clipart image MP900386221.

Worked Example

Two bottles of root beer and a $3 ice cream cost a total of $8.40. How much is each bottle? (Watch and discuss as your teacher shows the example on the screen).

Pairs or individual:

6). What is “x” worth in the problem below?

Picture

Equation

*x*

*x*

*x*

5 +

*x*

91 =

91 = 5 + 4*x*

Vocabulary Discussion: “ISOLATE”

* When we solve equations, we say the goal is to **isolate the variable**. Let’s talk about the word “isolate”. What characters from popular movies could be called “isolated”, and why?
* How did we isolate the variable when we solved #6?

Keeping an Equation Balanced

The equals sign () in an equation means that the two sides are balanced. For example, “2 + 3 = 5” means that 2 + 3 balances out with 5:

**2 rules to follow when solving equation:**

**a). The goal is to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**

**b). To keep the equation balanced, you have to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**

**Solving Equations with Algebra Tiles**

Use your algebra tiles to model this problem as your teacher shows you the steps on the screen.

2x + 3 = 7

7).

**Answer**

x = \_\_\_\_

Check: \_\_\_\_\_ = \_\_\_\_\_

Worked Example

8). Watch the example on the screen. After the equation is solved, please show the check step on your own below.

Individual or Pairs Practice

1 + 2x = 4x

9).

**Answer**

x = \_\_\_\_

Check: \_\_\_\_\_ = \_\_\_\_\_

Worked Example

10). Watch the example problem on the screen. Then answer the reflection question in the space below.

Small Group Practice:

Solve each equation using algebra tiles.

11). 2x + 4 = 10

12). 3x + 5 = 5x

x = \_\_\_\_. Check: \_\_\_\_ = \_\_\_\_

x = \_\_\_\_. Check: \_\_\_\_ = \_\_\_\_

13). x +10 = 3x + 2

x = \_\_\_\_. Check: \_\_\_\_ = \_\_\_\_

14). 13 = 3 + 2x

x = \_\_\_\_. Check: \_\_\_\_ = \_\_\_\_

15). 4x + 2 + x = 3x + 5

x = \_\_\_\_. Check: \_\_\_\_ = \_\_\_\_

16). 2 + 5x = 2x + 7 + 2x

x = \_\_\_\_. Check: \_\_\_\_ = \_\_\_\_

17). 2(x + 5) = 4x

x = \_\_\_\_. Check: \_\_\_\_ = \_\_\_\_