



Math Objectives

- Solving an **equation** with a real-world application.
- Creating an equation to represent a real-world problem.
- Recognize values of the variable that would not make sense for a real-world problem.

Vocabulary

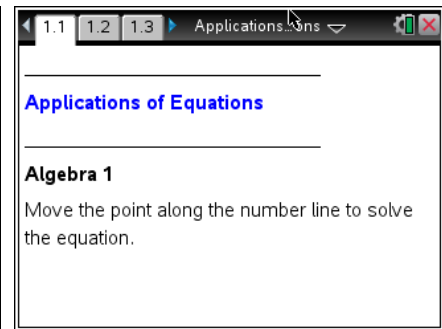
- equation
- variable

About the Lesson

- This lesson is a follow-up lesson to the activity *From Expressions to Equations*.
- This lesson involves understanding how to translate a real-world problem into an **equation**. The emphasis is on helping students understand how the **variable** in the equation relates to the answer in the problem.
- Students will slide a point attached to an arrow along a number line to solve the equation.

Related Lessons

- Prior to this lesson: From Expressions to Equations
- After this lesson: Visualizing Equations



TI-Nspire™ Technology Skills:

- Download a TI-Nspire document
- Open a document
- Move between pages
- Grab and drag a point

Tech Tips:

- Make sure the font size on your TI-Nspire handhelds is set to Medium.

Lesson Materials:

Student Activity

- ApplicationsOfEquations_Student.pdf
- ApplicationsOfEquations_Student.doc

TI-Nspire document

- ApplicationsOfEquations.tns

Visit www.mathnspired.com for lesson updates and tech tip videos.

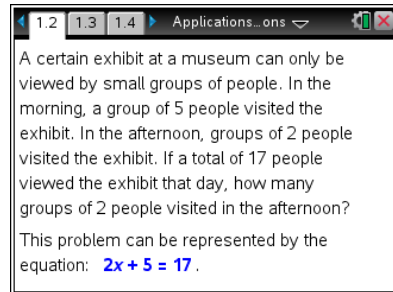


Discussion Points and Possible Answers:

Move to pages 1.2 – 1.4.

1. The equation that represents the problem is shown on page 1.2. What does x represent?

Answer: The value of x represents the number of groups of 2 that visited the exhibit in the afternoon.

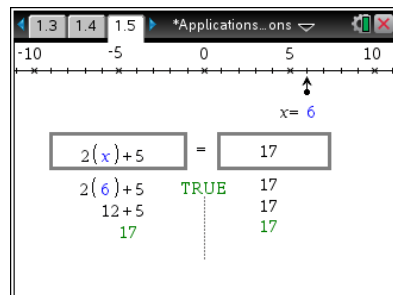


2. Why is x multiplied by 2 and not 5?

Sample Answer: There is only one group of 5 people possible, where as it is possible to have more than one group of 2 people.

Move to pages 1.5 – 1.6.

Students are to move the point along the number line. When the value of x satisfies the equation, the word “false” will change to “TRUE.”



Tech Tip: If students experience difficulty dragging a point, check to make sure that they have moved the cursor (arrow) until it becomes a hand (☞) getting ready to grab the point. Then press **ctrl** + **click** to grab the point and close the hand (☞). When finished moving the point, press **esc** to release the point.

3. What is the value of the left side of the equation when the word “false” changes to “TRUE?” What is the value of x ?

Answer: 17; $x = 6$

Teacher Tip: There is only one solution. For values of x greater than 6, the values of the expression are greater than 17. For values of x less than 6, the values of the expression are less than 17. For this expression, the value of the expression increases as the value of x increases.



4. Explain how the value of x can help you answer the question.

Sample Answer: The value of x that makes the statement true represents the number of pairs of people that visited the exhibit in the afternoon. The statement is true when $x = 6$, so that means that 6 groups of people visited the exhibit in the afternoon.

Teacher Tip: Students should relate the value of x to the context of the problem.

Move to pages 2.1 – 2.6.

5. Write an equation to represent the problem in terms of x . Explain what x represents.

Answer: $12x + 10 = 46$; x represents the number of dozens of flowers Sarah ordered.

Teacher Tip: You might need to guide the students in developing an equation. Students should first define what x represents and then write down how each part of the problem is related to x .

On page 2.3, students are to change the numbers in each box to match their equation from Question 5. To change the equation, they should double click on the portion of the equation that you want to change, type in the new text, and press .

6. What value(s) of x on the number line would not make sense for the problem? Explain your reasoning.

Answer: Any value equal to or less than 0.

Teacher Tip: Discuss with students why x cannot have a negative value and why 0 should not be included but is a possible value. You can also review what values of x would not make sense for the first real-world problem to support understanding.

7. How does the value of the expression on the left side of the equation change as the point moves to the right? To the left?

Answer: As the point moves to the right, the value of the expression increases. As the point moves to the left, the value of the expression decreases.



8. Explain how you can move the point to help you answer the question.

Answer: You move the point right or left until the expression on the left side of the equation is equal to the number on the right side of the equation. This is when the false changes to “TRUE.” The value of x at that point is the solution to the equation. In this case, the solution for x is 3, which is the number of dozens of flowers Sarah ordered.

Teacher Tip: Students should relate the solution for x to the context of the problem.

Wrap Up:

Upon completion of the discussion, the teacher should ensure that students are able to:

- understand how to translate a real-world problem into an equation
 - understand that the solution of the equation is the value of the variable that makes the equation true (both sides equal)
 - understand what the variable represents and how its possible values are limited
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