**Instruction**

## Lesson 2.4.1: Properties of Equality

**Georgia Standard of Excellence**

MGSE9–12.A.REI.1

## Warm-Up 2.4.1 Debrief

1. During the month of September, Sydney downloaded 22 e-books and was charged $75. How much does each additional download cost?

   Set up an equation to find the charge for each downloaded e-book over 10.

   $30 + (22 - 10)x = 75$

   Solve the equation.

   | | |
   |---|---|
   | $30 + (22 - 10)x = 75$ | Equation |
   | $30 + 12x = 75$ | Subtract 10 from 22. |
   | $12x = 45$ | Subtract 30 from both sides. |
   | $x = 3.75$ | Divide both sides by 12. |

   Each additional download costs $3.75.

2. In October, Sydney was incorrectly charged $67.50 for 18 e-books. How much should she have been charged?

   Set up an equation to find the amount that Sydney should have been charged.

   The cost for 10 e-books is $30. Each e-book over 10 costs an additional $3.75. The total correct cost is $30 + 3.75(x - 10)$.

   | | |
   |---|---|
   | Total cost $= 30 + 3.75(x - 10)$ | Equation |
   | Total cost $= 30 + 3.75[(18) - 10]$ | Substitute 18 for $x$. |
   | Total cost $= 30 + 3.75(8)$ | Subtract 10 from 18. |
   | Total cost $= 30 + 30$ | Multiply. |
   | Total cost $= 60$ | Simplify. |

   Sydney should have been charged $60 for 18 e-books.

3. If Sydney received a bill for $101.25, how many e-books did she download?

Use the equation for total cost found in problem 2 to determine the number of e-books Sydney downloaded.

| | |
|---|---|
| Total cost $= 30 + 3.75(x - 10)$ | Equation |
| $(101.25) = 30 + 3.75(x - 10)$ | Substitute $101.25 for the total cost. |
| $101.25 = 30 + 3.75x - 37.5$ | Distribute 3.75 over $(x - 10)$. |
| $101.25 = 3.75x - 7.5$ | Combine like terms. |
| $108.75 = 3.75x$ | Add 7.5 to both sides of the equation. |
| $29 = x$ | Divide both sides of the equation by 3.75. |

Sydney downloaded 29 e-books.

**Connection to the Lesson**

- Students will continue to use their knowledge of solving equations, but will be asked to justify the steps used in the process.