

## 6.EE Firefighter Allocation

### Task

A town's total allocation for firefighter's wages and benefits in a new budget is \$600,000. If wages are calculated at \$40,000 per firefighter and benefits at \$20,000 per firefighter, write an equation whose solution is the number of firefighters the town can employ if they spend their whole budget. Solve the equation.

### IM Commentary

In this students are asked to write an equation to solve a real-world problem. There are two natural approaches to this task. In the first approach, students have to notice that even though there is one variable, namely the number of firefighters, it is used in two different places. In the other approach, students can find the total cost per firefighter and then write the equation. A natural variant of this task requires students to write an inequality by changing the wording slightly (such a task is currently under development).

This task is adapted from Algebra: Form and Function, McCallum et al., Wiley 2010.

### Solutions

#### **Solution: Equation 1**

If  $x$  represents the maximum number of firemen that could be employed, then

$$600,000 = 40,000x + 20,000x.$$

combining like terms we have

$$600,000 = 60,000x$$

Thus  $x = 10$ , so ten firemen could be employed.

**Solution: Equation 2**

The total cost per firefighter is  $40,000 + 20,000 = 60,000$ . If  $x$  represents the number of firefighters that could be employed with the given budget amount, then

$$60,000x = 600,000.$$

Dividing both sides by 60,000 gives us that  $x = 10$ , so ten firefighters could be employed by the town.



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