# **Warm-Up** Solving Real-World Multistep Equations

**Lesson Question**

## Lesson Goals

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**W2K**

**Write** multistep equations for real-world scenarios.

**Solve** multistep equations to

real-world

problems.

**Verify** to

real-world linear equations.

**Words to Know**

*Fill in this table as you work through the lesson. You may also use the glossary to help you.*

|  |  |
| --- | --- |
| verify | to what is known to confirm an expected result |
| equation | a mathematical statement that uses an equals sign totwo algebraic expressions |
| perimeter | around a two-dimensional shape |
| variable | a letter or symbol used to represent an quantity |

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of the variable to solve the problem.

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1. Write the multistep
2. Solve for the variable.
3. Use the

2. Identify key words and translate the meaning.

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1. Determine the

**Solving Real-World Problems Using Multistep Equations**

**PROCEDURE**

**2**

3. Write the multistep equation.

+ (*g* + 21) + (2*g* − 6) =

*g* = Number of medals/Germany

Let, *GB* represent the medal count for Great Britain. Use *R* to represent Russia.

*GB* = *g* +

*R* = 2*g* −

1. Determine the variable.
2. Identify key words and translate the meaning

**Writing a Multistep Equation for a Real-World Scenario**

In the 2012 Summer Olympics, Great Britain won 21 more medals than Germany. Russia won 6 fewer than two times the number of medals Germany won. The three countries won a total of 191 medals.

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Russia won 82

*g* =

5. Use the value of the variable to solve the problem.

*R* = 2*g* − 6

*R* = 2(44) − 6

= − 6

= 82

4 4

4 *g*  176

= 191

− 15

− 15

**Writing a Multistep Equation for a Real-World Scenario**

The medal count for Germany, Great Britain, and Russia in the 2012 Summer Olympics is represented by the equation *g* + (*g* + 21) + (2*g* − 6) = 191, where *g* represents Germany’s total medal count. How many medals did Russia win if its athletes won 6 less than two times as many medals as Germany?

4. Solve for the variable.

*g* + *g* + 21 + 2*g* − 6 = 191

4*g* +

## Solving Problems Using the Variable

How many medals did Great Britain win if its athletes won 21 more medals than Germany?

**4**

*GB* = *g* + 21

= 44 +

*GB* =

* **Verify** that the medal counts for the three countries are correct.

The total number of medals should be 191.

44 + 65 + 82 = 191

191 = 191

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## Writing a Multistep Equation for a Real-World Scenario

Ride-n-Fly Shuttle charges $16.00 for pickup and an additional $0.20 for each mile traveled. Speedy Shuttle charges $4.00 for pickup and an additional $0.50 for each mile traveled. At what number of miles is the cost of both shuttle services the same?

Use *m* as the number of miles, which is the unknown.

*m* = #miles

*RF* = 0.20*m* +

*SS* = + 4

*RF* = *SS*

0.20*m* + 16 = 0.50*m* + 4

−0.20*m* −0.20*m*

16 = + 4

12

0.30

 0.30*m*

0.30

**8**

= *m*

40 is the number of miles at which we would have to travel for the of each shuttle to be the same.

**8**

**10**

*x*  2

*p* =

= 5(*x* − 2)

*x*  *5*

*x*

**Using a Model of a Mathematical Problem**

A regular pentagon and a rectangle have the same **perimeter**. The side of the pentagon is 2 units less than the length of the rectangle. The width of the

rectangle is 5 units more than the length of the rectangle. What is the perimeter of each figure?

*p* = 2*l* + 2*w*

= 2*x* + 2(*x* + 5)

**Slide**

**Verifying the Solution of a Real-World Scenario**

Equation: 0.20*m* + 16 = 0.50*m* + 4

*m* = 40

0.20(40) + 16 = 0.50(40) + 4

+ 16 = + 4

24 = 24

We have a true statement, and thus our solution is correct.

**Slide**

## Using a Model of a Mathematical Problem

Rectangle*p* = Pentagon*p*

2*x* + 2(*x* + 5) = 5(*x* − 2)

2*x* + 2*x* + = 5*x* − 10

4*x* + 10 = − 10

−4*x* −4*x*

10 = *x* − 10

+10 +10

= *x x* = 20

Perimeter of rectangle:

# = 2( ) + 2(20 + 5)

= 40 + 2(25)

= 40 + 50

=

Perimeter of pentagon:

= 5 ⋅

= 90

**10**

Since the perimeters came out the same, and our equation stated that the perimeters must be the same, we know that we have the correct answer.

**Lesson Question**

**??**

**2**

How can you solve multistep equations that represent real world scenarios?

**Lesson Question**

5. Use the value of the variable to solve the problem.

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4. Solve for the

3. Write the multistep equation.

and translate the meaning.

2. Identify

1. Determine the variable.

**Review: Key Concepts**

Solving real-world problems using multistep equations:

**Answer**

*Use this space to write any questions or thoughts about this lesson.*