



Student Handout: Unit 1, Lesson 1, Part 1  
Solving Equations, Part 1

In each of the following examples, you will be *solving for the unknown value*. The unknown value is represented by a letter, called a variable. Solve means find the value needed to make the equation true.

<p>1. Solve for y, the unknown.</p> $14y = 28$ $\frac{14}{14} y = \frac{28}{14}$ $y = 2$ <p>You try: Solve for g.</p> $6g = 24$ $g =$	<p>What must you multiply 14 by, in order to get the answer 28? You might guess that the correct answer is 2, but if you can't guess, there must be another way.</p> <p>Method: Divide both sides of the equation by the numerical coefficient (the number in front of the letter). This will <i>isolate the variable</i> (leave y by itself on one side of the equation). (<math>14y + 14 = 1y</math> or just y).</p> <p>The other side of the equation computes to 2. (<math>28 \div 14 = 2</math>). The value for y of 2 makes the equation true (the left side of the equation equals the right side of the equation).</p> <p>Divide both sides by the number in front of the letter. This isolates the variable.</p> <p>The value of g that makes the equation true is the solution: 4.</p>
<p>2. Solve for the unknown.</p> $f + 8 = 23$ $f + 8 - 8 = 23 - 8$ $f = 15$ <p>You try: Solve for h.</p> $h + 7 = 52$ $h + 7 = 52$ $h =$	<p>Method: Collect like terms, in order to isolate the variable.</p> <p>The 8 and 23 must be together (they are <i>like terms</i>). Must move 8 to the other side of the equal sign. Subtract 8 from both sides of the equation, using the balancing method. (What you do to one side, you must do to the other.) The f will be by itself (isolated). This is the solution.</p> <p>Collect like terms (put numbers together on one side), in order to isolate the variable.</p> <p>The value of h that makes the equation true is 45.</p>



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<p>3. Solve for the unknown.</p> $2b - 8 = 12$ $2b - 8 + 8 = 12 + 8$ $2b = 20$ $\frac{2b}{2} = \frac{20}{2}$ $b = 10$ <p>You try: Solve for k.</p> $5k = 2k + 15$ $k =$	<p>Method: Collect like terms, then isolate the variable.</p> <p>Collect like terms first, by putting all numbers on one side. Add 8 to both sides of the equation (balancing method). Simplify (get to the smallest expression possible).</p> <p>Divide both sides of the equation by the numerical coefficient, to isolate the variable.</p> <p>The value of b that makes the equation true is 10.</p> <p>To collect like terms, put all variables to one side. Did you move the 2k over to the left side of the equation by subtracting 2k from both sides?</p> <p>Isolate the variable.</p> <p>The value of k that makes the equation true is 5.</p>
<p>4. Solve for the unknown.</p> $y + 5 - 6y = 17 - 2y$ $-5y + 5 = 17 - 2y$ $-5y + 5 - 5 = 17 - 2y - 5$ $-5y = 12 - 2y$ $-5y + 2y = 12 - 2y + 2y$ $-3y = 12$ $\frac{-3y}{-3} = \frac{12}{-3}$ $-y = -4$	<p>Method: Collect like terms, then isolate the variable.</p> <p>Collect like terms on each side first. Simplify each side of the equation first.</p> <p>Then move all variables to the left side and all numbers to the right side of the equal sign. Subtract 5 from both sides of the equation and add 2y to both sides of the equation.</p> <p>Even if the numerical coefficient is a negative number, divide both sides by it. This will isolate the variable.</p> <p>The value of y that makes the equation true is -4.</p>



## **Assessment and Evaluation: Unit 1, Lesson 1, Part 1**

For each question below, solve for the unknown value.

1.  $3x = 27$

2.  $c + 11 = -14$

3.  $2m - 7 = m + 54$

4.  $4m - 7 = 25$

5.  $5x + 9 = 4x - 13$

6.  $6b + 3 = 3b - 12$

7.  $3a + 8 + 2a = a - 9 + 1$

8.  $2g + 7 + 4 = g - 6 + 4g - 1$