Title: Solving Basic Problems with Algebra

Objectives

Many ask the question, "How do I apply algebra?" I have created three basic sample problems to help students understand algebra applications in real situations. I will demonstrate how we use mathematical equations in order to solve real life problems.

Time frame to Complete

30-40 minutes

NRS EFL

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Stackable Cert. Documentation	*Technology*	*Study / Life skills*	*EL-Civics*	*Career Pathways*	Police	Paramedic	Fire Rescue	Medical Asst.	EKG / Cardio	Phlebotomy	Practical Nursing	Healthcare Admin	Pharmacy Tech	IMT	AMT	HVAC	Welding	Other:					
X		X																					

Standard(s) Addressed in Lesson

Use Math to Solve Problems and Communicate

Benchmark(s) Addressed in Lesson

M.4.3 Apply order of operations to simplify expressions and perform computations
M.4.16 Evaluate and simplify algebraic expressions and solve equations.
M.4.19 Solve linear equations with one unknown graphically and algebraically.

Materials

Paper and pencil, handout (attached)

Learner Prior Knowledge

- Adding, subtracting, multiplying, and dividing of signed numbers
- Simplifying like terms in an expression
- Order of operations
- The concept of the equation and the language of algebra (These foundation lessons can all come from Chapter 10 in the Contemporary GED Mathematics textbook, pages 281 through 302.)
- Definition of a right triangle
- Definition of "consecutive" numbers

Activities

Step 1 Put the first problem up on the board, or pass problem out to students.

Step 2 Ask learner to read problem and see if he can guess what the answer might be. Share guesses with class.

Step 3 Show learner how to set up problem by thinking out loud to help learner understand the thinking processes involved. Find the key unknown, representing it with a variable, representing other unknowns in terms of that variable, and then setting up the equation.

Step 4 Demonstrate how to solve the problem for the unknown, and answer the question asked, thinking aloud as you go through each step of the process.

Step 5 Demonstrate how to check for correctness.

Step 6 Go to next problem, have learner try to solve on their own, and then demonstrate solving it at the board.

Step 7 Have learner tackle the third problem on the handout and see if he is able to solve it on his own.

Assessment/Evidence

Problem 3 on the handout

Adaptations for Beginning Students

Beginning students can work with a person who has had the prior lessons and use the calculator.

Adaptations for Advanced Students

Assign more problems such as pages 315-316 in the Contemporary's GED book.

Teacher Reflection/Lesson Evaluation

If a student can do problems like this, they have a keen understanding of the application of algebra and they can see how it helps take the guesswork out of simple math problems.

This lesson was created by Middletown ABLE.

Brain Teasers to Solve Using Algebra

1) **I am six years older than my sister. The sum of our ages is 30. How old am I?**

   Hint: Let my sister's age be n.

2) **A right triangle has three sides that are consecutive whole numbers. The perimeter of the triangle is 12 feet. How long is each side?**

1) **Adam walked 10 miles farther than his partner, Sam. The two men walked a total of 40 miles combined. How far did each man walk?**

Brain Teasers to Solve Using Algebra

KEY

1) **I am six years older than my sister. The sum of our ages is 30. How old am I?**

Hint: Let my sister's age be n.

Sis = n me = n + 6

$n + (n+6) = 30$

$2n + 6 = 30$

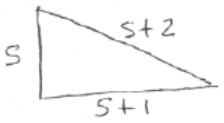
$-6 \quad -6$

$2n = 24$

$n = 12$

I am (n+6) or 12+6,
So I am 18 years old

2) **A right triangle has three sides that are consecutive whole numbers. The perimeter of the triangle is 12 feet. How long is each side?**



Let smallest number be s.
The next larger no. is s+1
The " " " is s+2

$s + (s+1) + (s+2) = 12$

$3s + 3 = 12$

$-3 \quad -3$

$\frac{3s}{3} = \frac{9}{3}$

$s = 3$

The numbers are
3, 4, 5

3) **Adam walked 10 miles farther than his partner, Sam. The two men walked a total of 40 miles combined. How far did each man walk?**

Let Sam be x
Let Adam be x+10

$x + (x+10) = 40$

$2x + 10 = 40$

$-10 \quad -10$

$2x = 30$

$x = 15$

Sam walked 15 mi.
Adam walked 25 mi.