Learning Project 8 Geometry – Area, Perimeter, & Volume

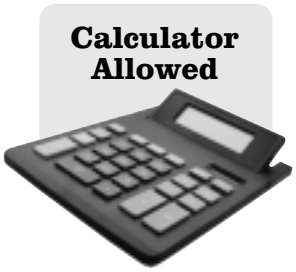
Inquiry Activity Geometry 8–3: Triangles

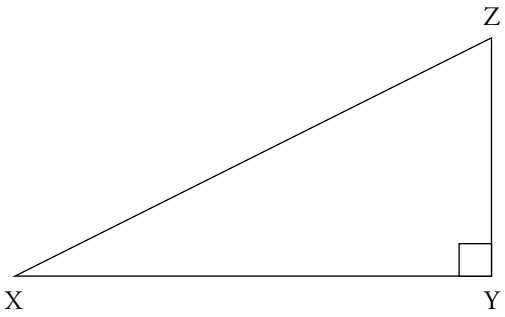
(Note: Italicized portions should be directed to students.)

1. Identifying the Problem (Item #8, PA) Calculator allowed.

Read the question carefully, as you would if taking the actual test.

8. Leg XY of the right triangle shown in the diagram is twice as long as the leg YZ.





If the area of the triangle is 36 cm^2, what is the length, in cm, of leg XY?

1) 6
2) 9
3) 12
4) 18
5) 24

Here are some problem clarification questions you may want to consider when reading test questions.

What words and/or symbols might be important to understand to answer this problem and what are they telling you?

It is possible that learners would pick leg, right triangle, diagram, twice as long, area, cm^2, length, leg XY, among others.

What words and/or symbols are unfamiliar and what do you think they mean?

Cannot know what words the learner will choose.

2. Becoming Familiar with the Problem

Ask yourself questions like these about the problem, taking note of the ones that were especially helpful so that you can remember to use them when you take the test.

Reread the question.

In your own words, what are you being asked to find?

Think about the knowledge you have of triangles and right triangles.

3. Planning, Assigning and Performing Tasks

Try to answer the test question any way you can, even if you have to guess, but try to be aware of the reasoning and operations that you are using. The following questions can be helpful.

Make a sketch that will help you to determine what is to be found in this item.

The sketch could be the diagram with the lengths of given lengths incorporated. Also learners can draw a rectangle on graph paper draw a line that would divide the box into two triangles, showing that a right triangle is 1/2 of a rectangle. If no one comes up with this at this point, can use it in the Reflect or Extend portions of step 5.

Try using the formulas page.

Estimate an answer.

Eliminate some of the answer choices and explain why you eliminated them.

Might eliminate answer with 6 since there is not an easy number that when multiplied, equals 6. In other words, the square root of 6 is not an easy number to determine.

Choose an answer and be ready to explain how you found your answer.

4. Sharing with Others

Telling other people what you know helps you to understand the material better. So take this opportunity not only to share your knowledge, but also to learn it more completely.

Small Groups: *Compare your answer to others in the group and explain how you found it. Compare sketches that were used to help find an answer, if any, and determine which sketch helps the best. If you have trouble agreeing on one answer, be ready to explain the reasons behind your disagreement.*

There are many possibilities for disagreement. Everyone in the class can learn from the disagreements so they should be brought to the whole-class discussion.

Explain any help you got from the formulas page.

Research the meaning of the unfamiliar words and/or symbols from this problem and the math terms "square units" and "area."

Whole class: *Report your group's answer (or your disagreement over the answer) to this question, along with a sketch, if any, that best helps you come to an answer, an explanation of how the formulas page can help, and the words and/or symbols and their definitions that were discussed in your group.*

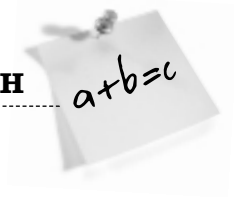
Take notes on any different ways that others used to find the answer.

5. Reflecting, Extending and Evaluating

This Inquiry Activity continues the discussion of area started in the last Inquiry Activity. Here the discussion moves from the area of rectangles to the area of right triangles. The formula for area of triangles should be discussed in its relation to rectangles. Many area problems have the learner find the area. Here the area is a given and the learner has to manipulate the formula for the area of a triangle to come up with the answer. The lessons learned in algebra about working through an equation are very prevalent here. This is a rich problem.

Reflect: Think about what you learned. (group activity or instructor led.)

Here are some questions to start you thinking about the experience you just had. Thinking about what you have learned and experienced is part of the learning process. When the focus is only on the answer, you don't get much time to think about what was learned.



Review all the different ways that were presented to find the answer to this problem and determine the most efficient method to solve the problem.

Suppose the length of ZY is 5, XY is twice that size and you have to find the area using graph paper only. Would you be able to count the squares to find the area of the triangle? Explain.

What else could you do using graph paper to find out exactly the area of this triangle?

Can draw a rectangle with the sides given, count the total number of boxes in the angle, then realizing that the triangle is 1/2 the rectangle, divide the total by two.

Find the formula for the area of a triangle on the formulas page.

What is the relationship between the formula and the use of graph paper to solve this problem?

Extending: Extend what you learned to new situations.

In extending, you are being asked to transfer the information presented in the Practice Test question to other information or situations you already know and maybe make new connections to other information.

How do you set up and use the formula for triangles when you have one side is an unknown (ZY) and the other side (XY) is twice the size?

How can you use algebra to set up this equation?

Discuss situations in your lives that would require you to use triangles.

Evaluating: Assess what you learned and how you learned it.

In this last step, you get a chance to review the content of what you learned and the methods used to learn. There are no right or wrong answers to these questions; it is your chance to look more closely at your learning style and the opportunity to state how you benefited or didn't benefit from the content and/or the methods to help you pass the GED test.

In step 5, Reflecting, Extending, Evaluating, we ask you to start you thinking about the experience you just had. We then go on to say:

Thinking about what you have learned and experienced is part of the learning process. When the focus is only on the answer, you don't get much time to think about what was learned.

Would you agree that thinking about what you did in solving a problem is part of the learning process? Explain.

Ask for practice exercises in any of the areas covered in this Inquiry Activity if you think you need them.