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Real-Life Indy

By Linda Buchwald

- Archaeologist Holly Cuzzone digs math, especially the Pythagorean theorem.

If you think Indiana Jones is cool, meet Holly Cuzzone, an *archaeologist* just like Indy. Except, of course, she's a real person! An archaeologist studies ancient materials, or *artifacts*, to discover what humans were like in the past.

Holly lives in Connecticut. She has a master's degree in biochemistry and worked in that field before deciding that her real interest was archaeology. "I hated history," Holly told *MATH*. "Now I am so into it because the artifacts bring it to life for me."

Holly went back to school (to Yale University, one of the top colleges in the country!) to earn a second master's degree. It's a good thing she was a strong math student because much of her work involves measurement and geometry.

After Holly does her research, she usually has an idea of where a particular artifact is located. She puts stakes in the ground to mark where she thinks the artifact is. Sometimes, it is a very large space (for example, 130 feet by 130 feet. Holly can't dig up the entire area, so she samples smaller sections, forming right triangles with three stakes and tape until she finds what she is looking for. She uses the *Pythagorean theorem* to find the length of the diagonal side--the *hypotenuse*. "Pythagorean theorem is easy. I love using it," Holly said. Now try it yourself. It takes more than a cool hat to be Indiana Jones!

What to Do

Read "Pythagorean Theorem" below. Then, answer our questions to help Holly in her excavation.

One Way to Do It: Pythagorean Theorem

The *Pythagorean theorem* is named after the Greek mathematician Pythagoras, who lived about 2,500 years ago! He discovered that in any right triangle with sides of lengths a , b , and c (c being the *hypotenuse*, the side across from the right angle): [\(See picture, "Diagram: Pythagorean Theorem."\)](#)

Example: In a right triangle, $a = 3$ meters and $b = 4$ meters. Find c .



- $3^2 + 4^2 = c^2$
- $9 + 16 = 25$
- $c^2 = 25$
- $c = 5$ meters

1. Holly is digging for very old pottery on some South Carolina farmland. The piece of land she's examining is 25 meters (m) by 25 m. She wants to tape off a right triangle where side $a = 6$ m and side $b = 8$ m.

- a. What equation would you solve to find the length of the hypotenuse (c)?
- b. What is the length of the hypotenuse?
- c. How much total tape will Holly need for the three sides of the triangle?

2. She still didn't find what she was looking for, so Holly needs to extend her triangle. Now side $a = 8$ m and side $b = 15$ m. How much tape does she need for side c ?

3. Holly thinks she found something, so now she narrows her triangle again: side $a = 5$ m and side $c = 13$ m. How long is side b ?

4. On another dig, Holly is looking in a historic site to see what tools the people who lived there used. The room's side $a = 20$ m and side $b = 21$ m. How long is side c ?

5. Holly found grinding stones, so she knows that whoever lived there used grain for cooking. She tapes off another triangle outside for other archaeologists to continue digging. Side $b = 24$ m and side $c = 25$ m. How long is side a ?

Think About It

Holly gave us a long list of different types of math she uses. What other math skills do you think an archeologist would need?

Going Pro

The Job: Archaeologist

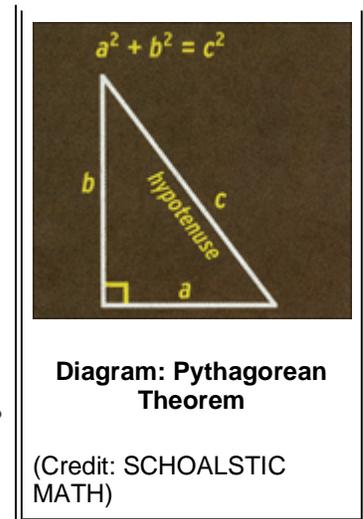
The Money: You can earn from \$40,000 to \$80,000 a year. "It's not a big moneymaking job." Holly said, "but it's a lot of fun."

Necessary Skills: Strong math and science skills, especially biology, geology, and chemistry; an interest in history.

How to Get Started: There are many archaeology camps for which you can sign up. (Holly works for one called Bones & Stones.) Visit museums. Go on digs. You will need at least a bachelor's degree in college, but most jobs require a master's degree.

Holly Says: "I still love math. And it really helped me out. There's a class we had to take, and everybody thought I was a whiz because I knew my math."

Answers



1a. $6^2 + 8^2 = c^2$

- b. 10 meters
- c. 24 meters

2. 17 meters

3. 12 meters

4. 29 meters

5. 7 meters

Think About It: Answers will vary. Holly told us she uses an x, y, and z (depth) grid system; measures length, width, and thickness of artifacts; graphs her results; analyzes data; estimates age/size of animals; and more!

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