

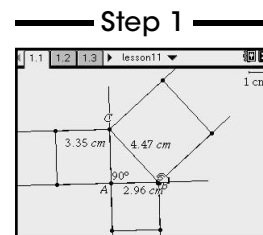


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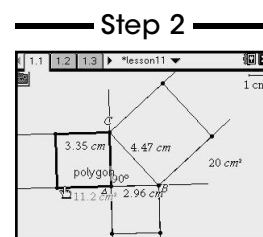
Exploring Right Triangles

Directions: Follow the steps below. The page numbers refer to the TI-Nspire document *lesson11*.

1. On page 1.1, $\triangle ABC$ is a right triangle. A square has been built using each side of $\triangle ABC$. Drag points B and C, and watch how the squares change. Does one square always appear to be the largest? Why?



2. Measure the area of each square. Drag points B and C, and watch how the areas change. Explain how the area of each square is related to the triangle.



3. What relationships do you see among the areas of the three squares?

Exploring Right Triangles (cont.)

Directions: Follow the steps below. The page numbers refer to the TI-Nspire document *lesson11*.

4. Move to page 1.2. This sketch is like the one on page 1.1, but the areas of the squares have been defined as variables. The spreadsheet on page 1.3 is set up to capture the three areas in columns A, B, and C when you command it to. Drag point B or C. Stop and press $\text{ctrl} \text{ (.)}$ to capture the three measurements. Repeat this 10 times.

Examine the data in spreadsheet 1.3. Choose two rows of information from your chart and record them in the table below.

arealeg1	arealeg2	areahyp

5. What relationships do you see among the three columns in the spreadsheet?

Use column D (or beyond) to test your ideas by typing equations into the “diamond” row.

6. Write an equation to show how the three areas are related.

7. Complete the statement below by filling in the blanks.

The Pythagorean Theorem states that for a right triangle:

$$(\text{leg } 1)^2 + (\text{leg } 2)^2 = (\text{hypotenuse})^2 \quad \text{OR} \quad \underline{\hspace{1cm}}^2 + \underline{\hspace{1cm}}^2 = \underline{\hspace{1cm}}^2$$



Name _____

Using the Pythagorean Theorem

Directions: Follow the steps below. The page numbers refer to the TI-Nspire document *lesson11*.

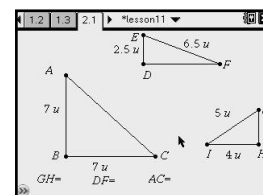
- Look at the right triangles on page 2.1. Use page 2.2 to calculate the missing side lengths for each triangle and type them on page 2.1 in the appropriate places on the page. Check your work using the Measurement Tool. Then, record the lengths below.

$\overline{AC} =$ _____

$\overline{DF} =$ _____

$\overline{GH} =$ _____

Step 1



Directions: The lengths of the legs of a right triangle are given. Find the missing hypotenuse length. Show your work using the Pythagorean Theorem. Use page 2.2 for any calculations you need to perform.

2. $a = 3, b = 4, c =$ _____

3. $a = 8, b = 10, c =$ _____

4. $a = 7, b = 4, c =$ _____

Using the Pythagorean Theorem (cont.)

Directions: The lengths of one leg and the hypotenuse of a right triangle are given. Find the missing leg length. Show your work using the Pythagorean Theorem. Use page 2.2 for any calculations you need to perform.

5. $a = \underline{\hspace{1cm}}$, $b = 4$, $c = 15$

6. $a = 9$, $b = \underline{\hspace{1cm}}$, $c = 22$

7. $a = 5$, $b = \underline{\hspace{1cm}}$, $c = 12$

8. What is the length of the diagonal of a square with an area of 100 cm^2 ?

9. A rectangular field has a length of 40 feet and a diagonal of 80 feet. What is the perimeter of the field?



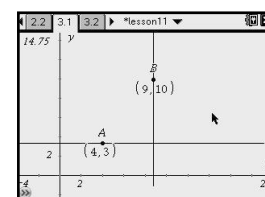
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Pythagorean Theorem and the Distance Formula

Directions: Follow the steps below. The page numbers refer to the TI-Nspire document *lesson11*.

1. To travel from point A to point B on page 3.1, how far would you move in a horizontal direction? To travel from point A to point B, how far would you move in a vertical direction?

Step 1



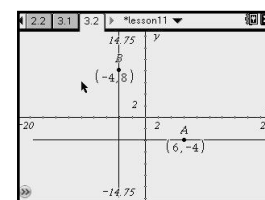
2. Construct point C at the intersection of the line through point A and the line through point B. Label the coordinates of point C. Notice that point C has the same x -coordinate as point B and the same y -coordinate as point A. What shape is formed by points A, B, and C? (Connect points A and B using a segment, if needed.)

3. Use the Pythagorean Theorem to find the length of $\overline{AB}$. This is the distance between A and B.

$\overline{AB} =$ _____

4. Press $\text{(ctrl)} \blacktriangleright$ to tab to page 3.2. To travel from point A to point B, how far would you move in a horizontal direction? To travel from point A to point B, how far would you move in a vertical direction?

Step 4



5. Construct point C at the intersection of the line through point A and the line through point B. Label the coordinates of point C. What shape is formed by points A, B, and C? (Connect points A and B, if needed.)

Pythagorean Theorem and the Distance Formula *(cont.)*

Directions: Follow the steps below. The page numbers refer to the TI-Nspire document *lesson11*.

6. Use the Pythagorean Theorem to find the length of $\overline{AB}$. This is the distance between A and B.

$\overline{AB} =$ _____

7. The distance formula used to find the distance between two points in the coordinate plane is

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

What does this formula mean?
