General Algebra II

Lesson #2 Unit 13

Class Worksheet #2

For Worksheets #3 & #4

General Algebra II CWS #2 Unit 13

Solve each of the following problems. Show your complete solution, including an appropriate diagram, neatly organized in the space provided.

1. Tom is 500 feet from a very tall building on level ground. If the angle of elevation to the top of the building is 20 degrees, then how tall is the building?

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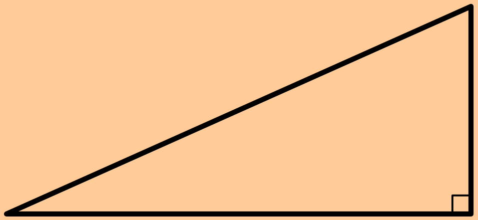

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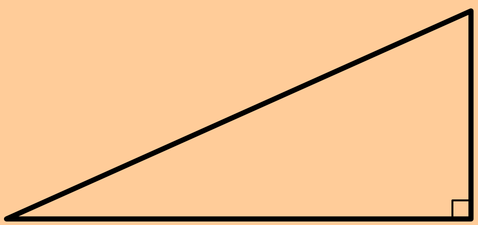

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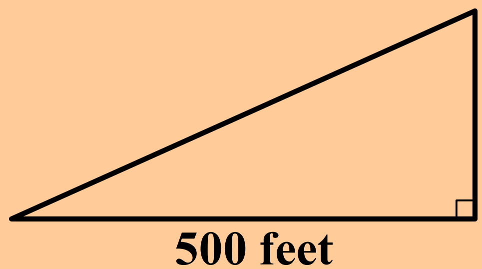

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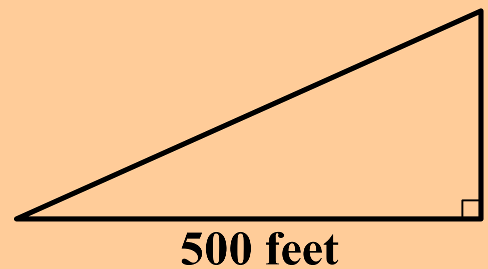

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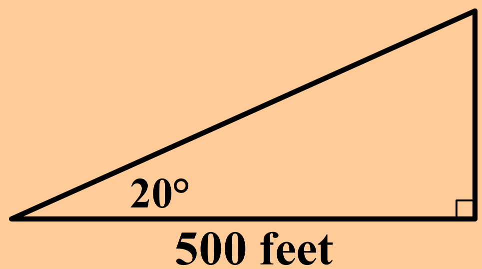

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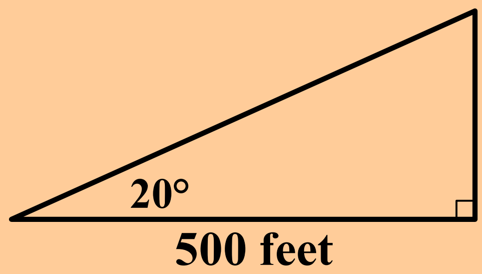

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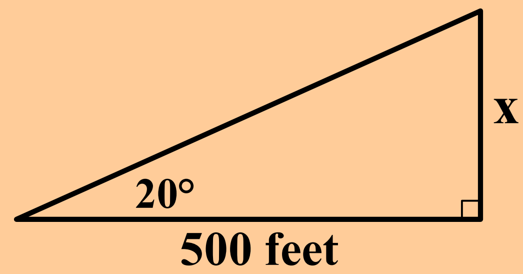

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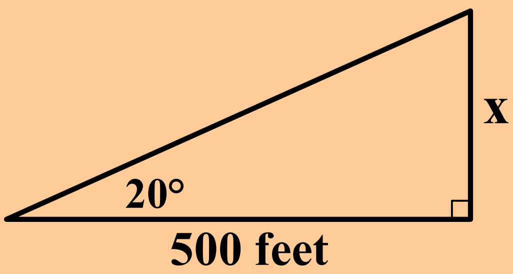

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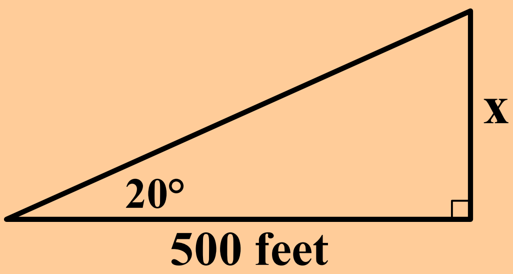

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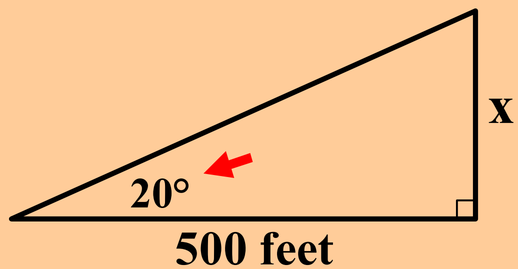
Given the measure of an acute angle



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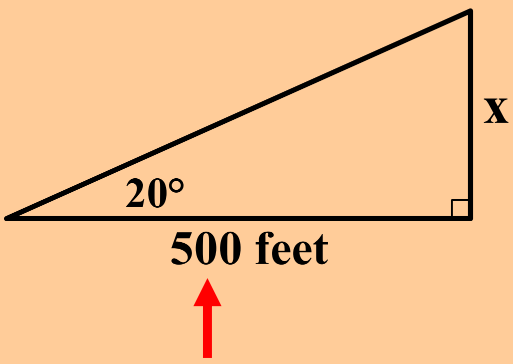
Given the measure of an acute angle and the length of the leg adjacent to the acute angle,



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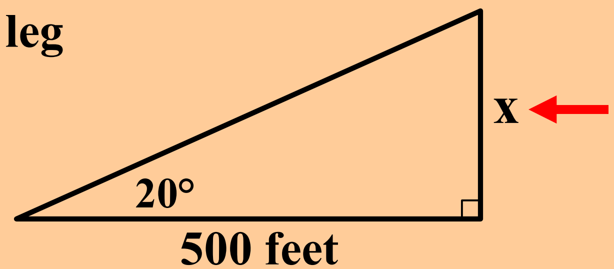

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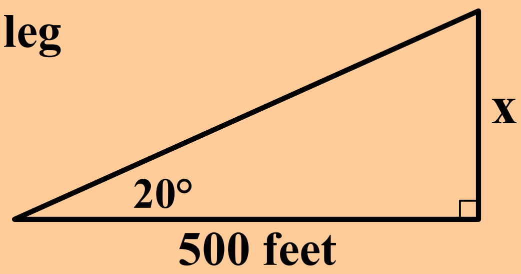

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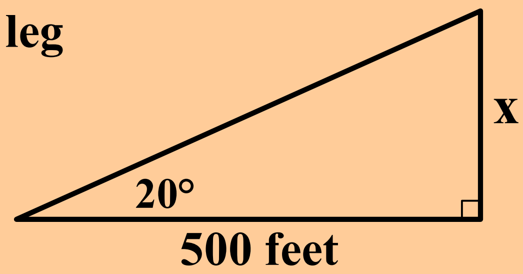

$$\text{tangent of the acute angle} = \frac{\text{length of the opposite leg}}{\text{length of the adjacent leg}}$$

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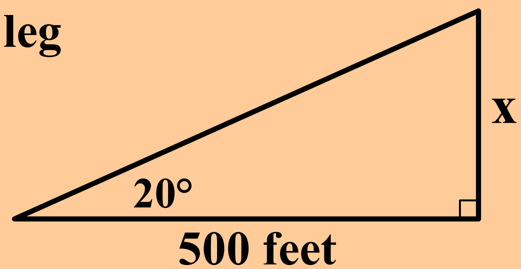

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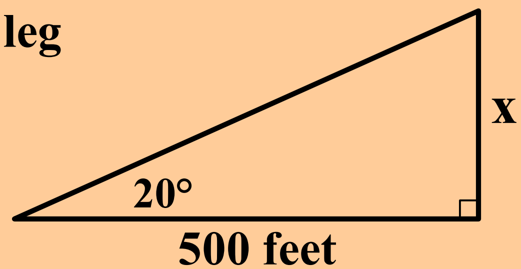

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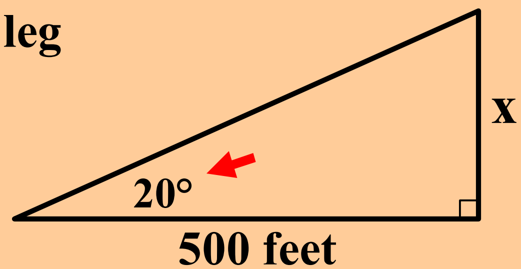

$\tan 20° =$

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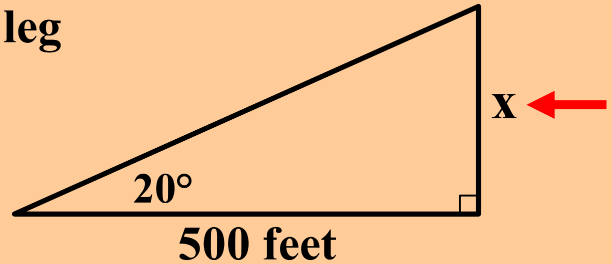

$$\tan 20° = \frac{x}{}$$

$$\text{tangent of the acute angle} = \frac{\text{length of the opposite leg}}{\text{length of the adjacent leg}}$$

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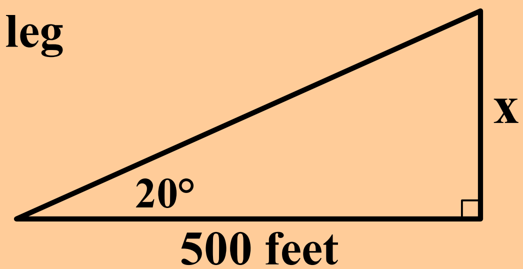

$$\tan 20° = \frac{x}{500}$$

$$\text{tangent of the acute angle} = \frac{\text{length of the opposite leg}}{\text{length of the adjacent leg}}$$

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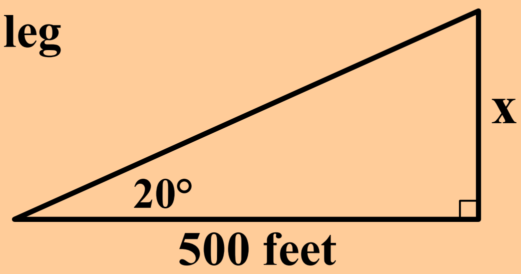

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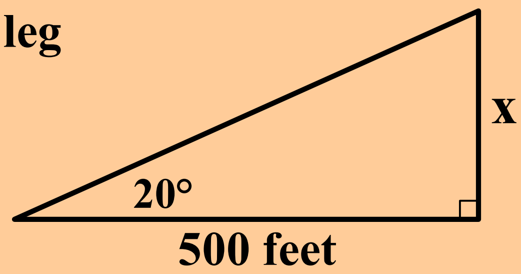

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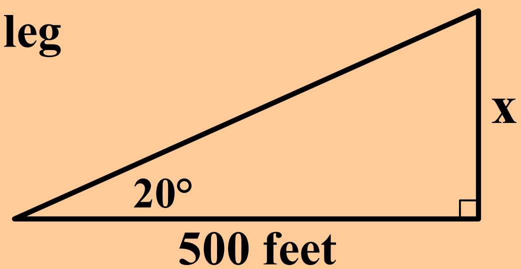

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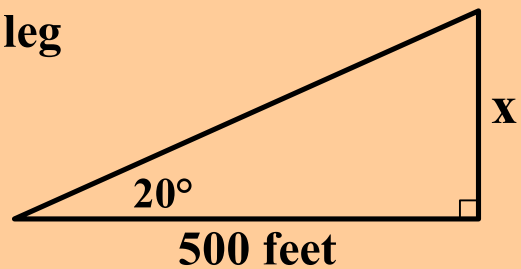

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$$x = 500$$

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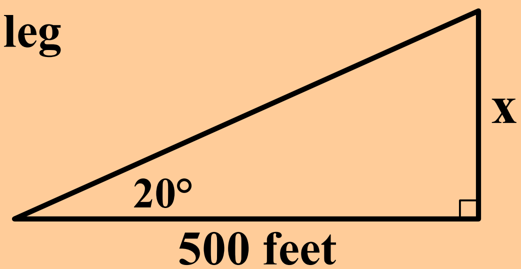

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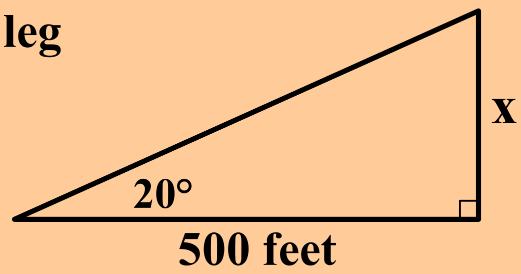

$$\tan 20° = \frac{x}{500}$$

$$x = 500 \tan 20°$$

$$x \approx$$

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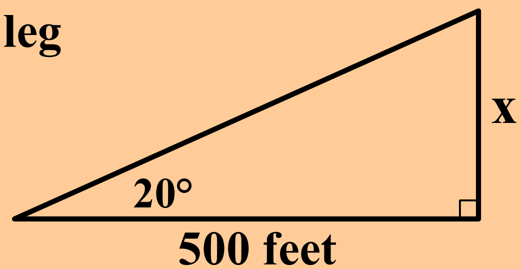

$$\tan 20^\circ = \frac{x}{500}$$

$$x = 500 \tan 20^\circ$$

$$x \approx 182.0$$

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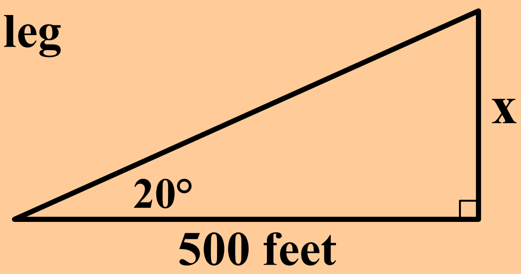

$$\tan 20° = \frac{x}{500}$$

$$x = 500 \tan 20°$$

$$x \approx 182.0$$

The building is about 182 feet tall.

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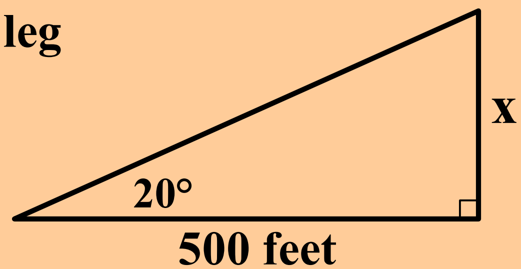

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Solve each of the following problems. Show your complete solution, including an appropriate diagram, neatly organized in the space provided.

2. A guy wire goes from the top of a vertical pole to a point that is 10 meters from the base of the pole on level ground. If the wire makes an angle of 55 degrees with the ground, then how long is the wire?

Step 1: Draw a diagram for the problem, using the variable x for the unknown.

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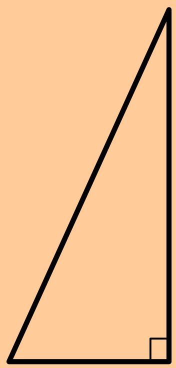

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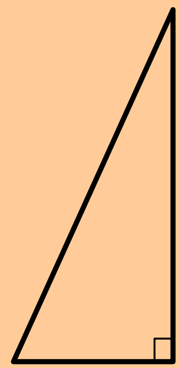

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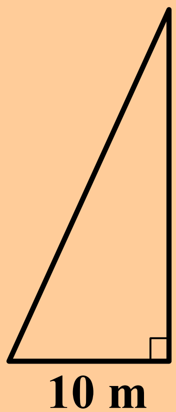

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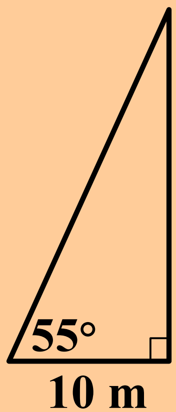

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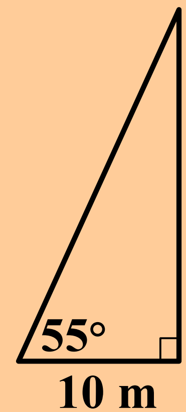

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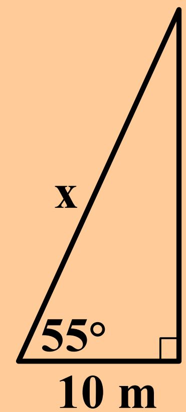

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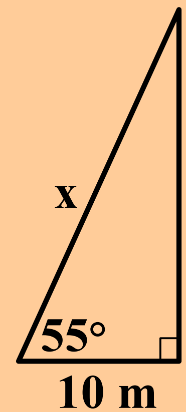

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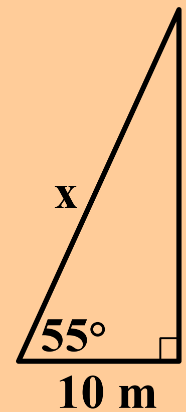

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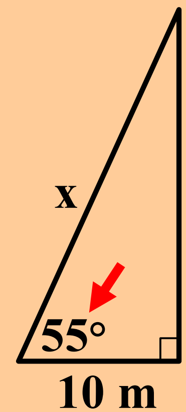
Given the measure of an acute angle



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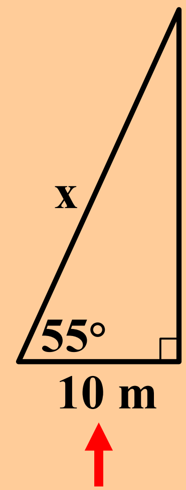

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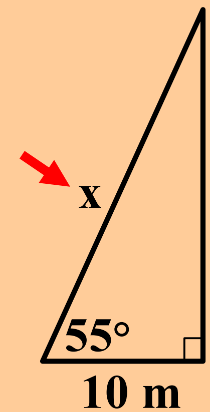

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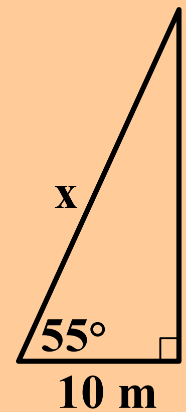

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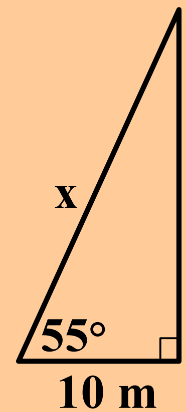

$$\text{cosine of the acute angle} = \frac{\text{length of the adjacent leg}}{\text{length of the hypotenuse}}$$

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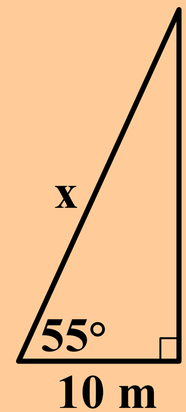

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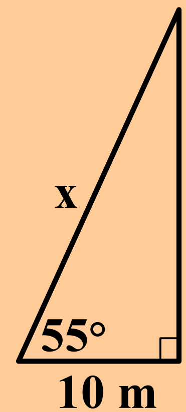

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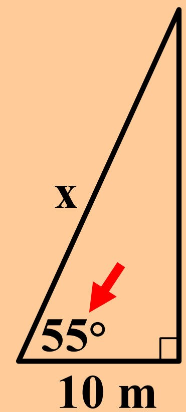

$\cos 55° =$

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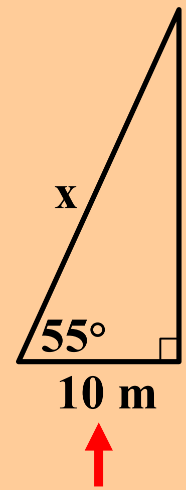

$$\cos 55° = \frac{10}{}$$

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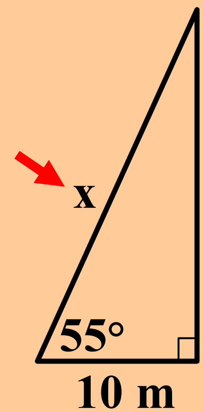

$$\cos 55° = \frac{10}{x}$$

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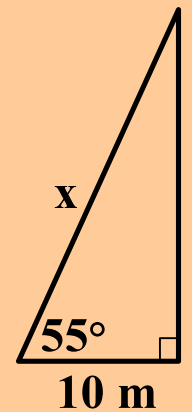

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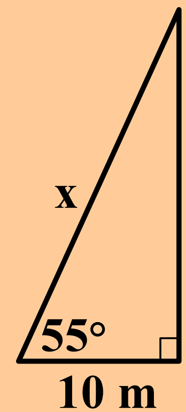

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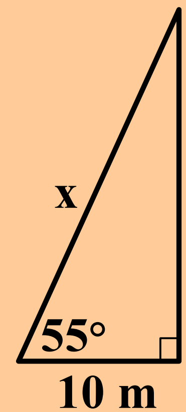

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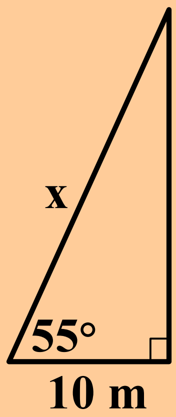

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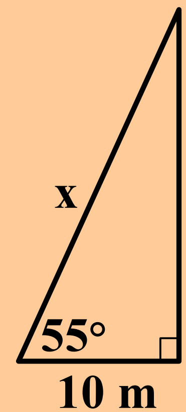
$$x = \frac{10}{\cos 55°}$$



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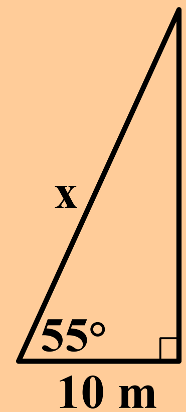

$$\cos 55° = \frac{10}{x}$$

$$x = \frac{10}{\cos 55°}$$

$$x \approx$$

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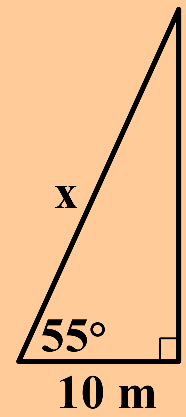

$$\cos 55° = \frac{10}{x}$$

$$x = \frac{10}{\cos 55°}$$

$$x \approx 17.4$$

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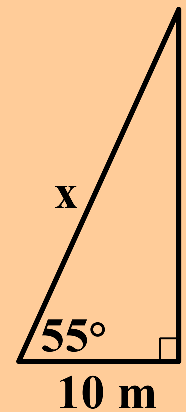

$$\cos 55° = \frac{10}{x}$$

$$x = \frac{10}{\cos 55°}$$

$$x \approx 17.4$$

The wire is about 17.4 meters long.

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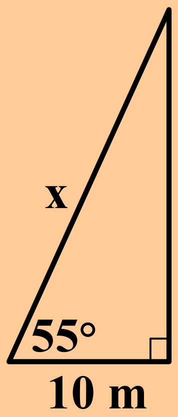

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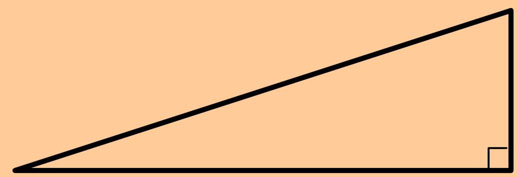

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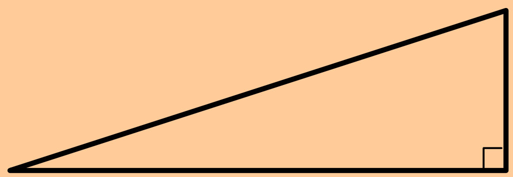

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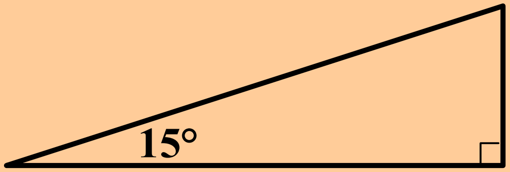

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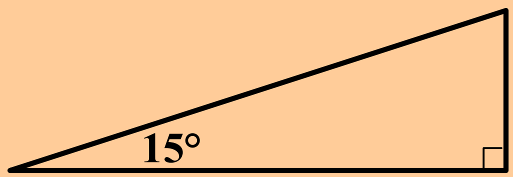

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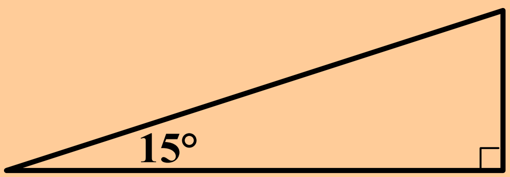

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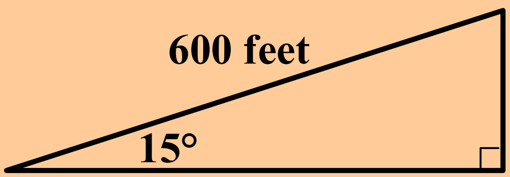

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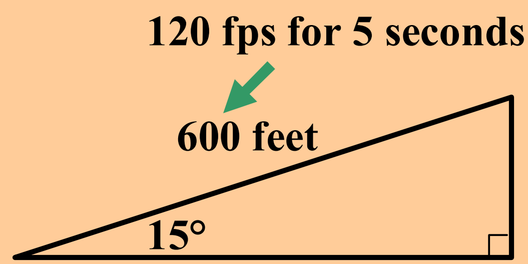

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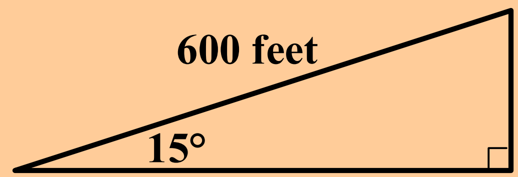

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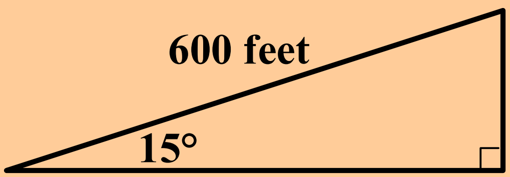

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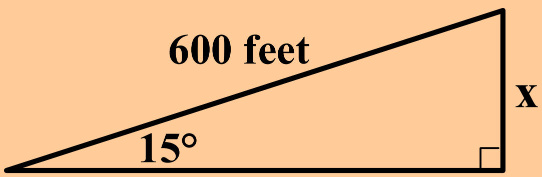

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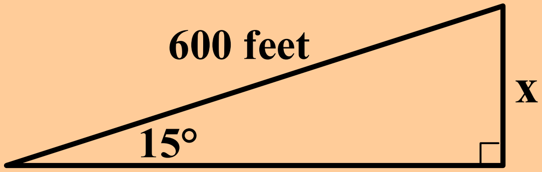

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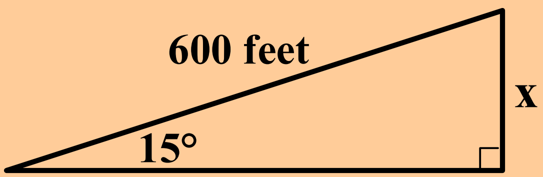

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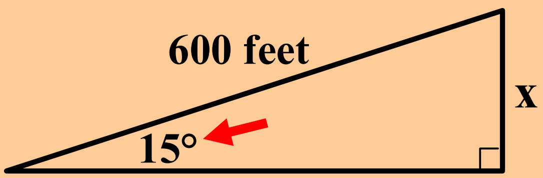
Given the measure of an acute angle



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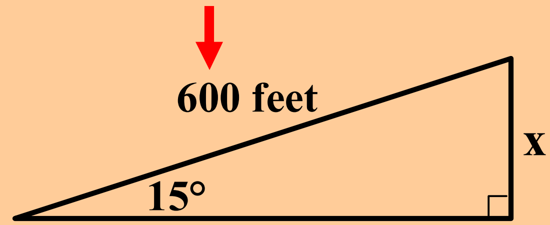
Given the measure of an acute angle and the length of the hypotenuse,



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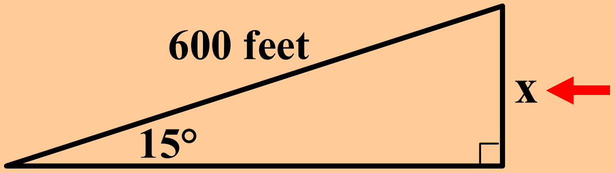

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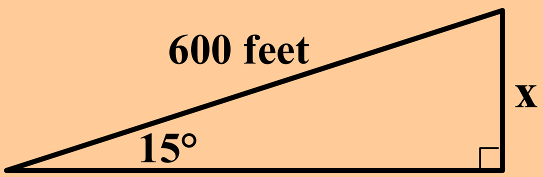

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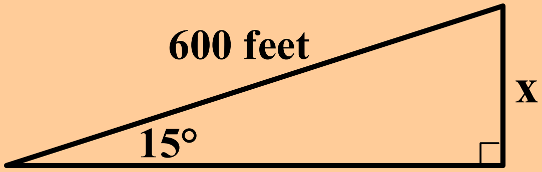

$$\text{sine of the acute angle} = \frac{\text{length of the opposite leg}}{\text{length of the hypotenuse}}$$

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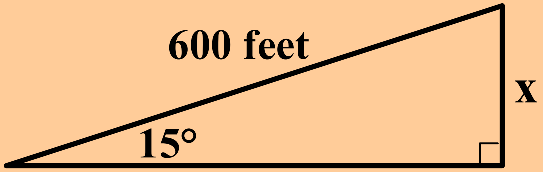

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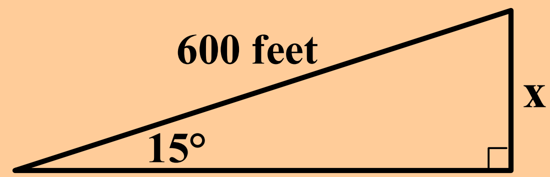

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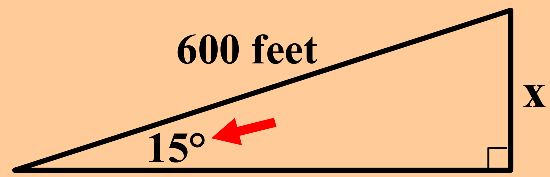

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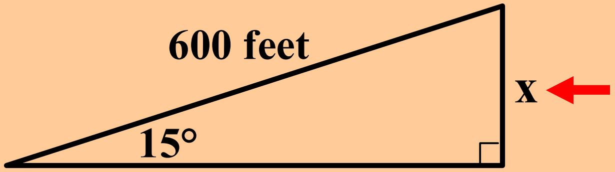
$$\sin 15° = \frac{x}{\quad}$$



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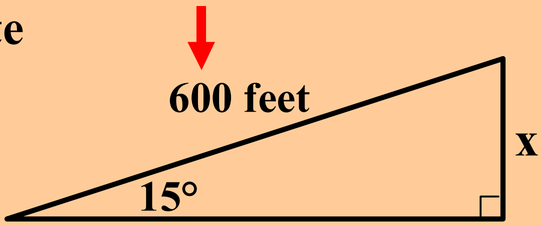

$$\sin 15° = \frac{x}{600}$$

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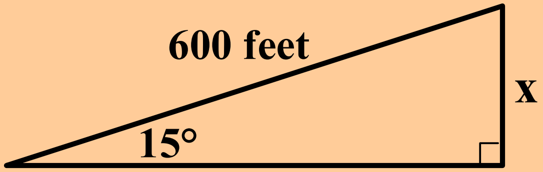

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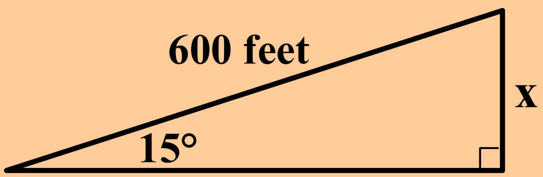

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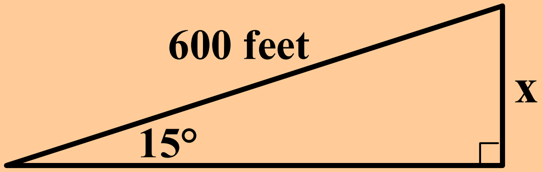

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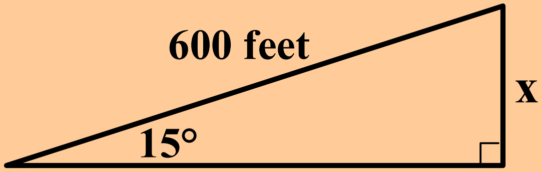

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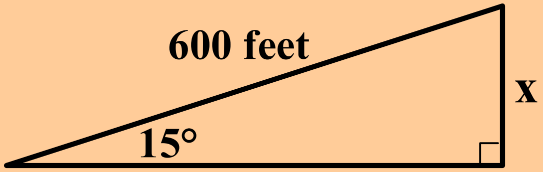

$$\sin 15^\circ = \frac{x}{600}$$

$$x = 600 \sin 15^\circ$$

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General Algebra II CWS #2 Unit 13

Solve each of the following problems. Show your complete solution, including an appropriate diagram, neatly organized in the space provided.

3. An airplane takes off on level ground with a constant speed of 120 feet per second. If its flight path makes an angle of 15 degrees with the ground, then how high above the ground will it be 5 seconds after 'lift off'?

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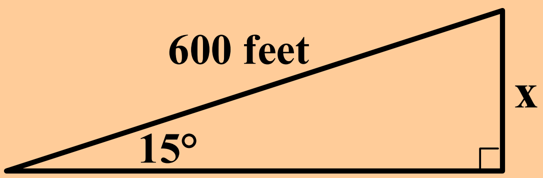

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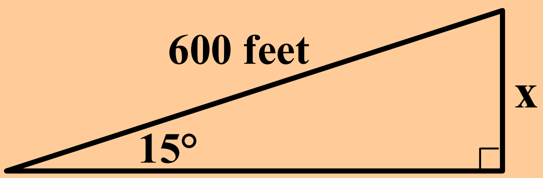

$$\sin 15^\circ = \frac{x}{600}$$

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$$x \approx 155.3$$

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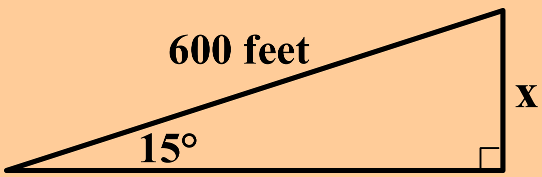

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The plane is about 155.3 feet above the ground.

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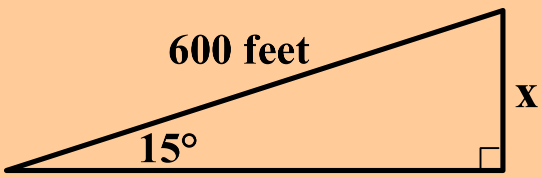

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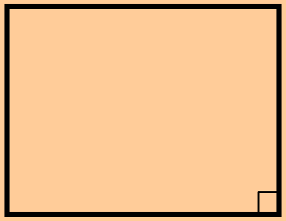

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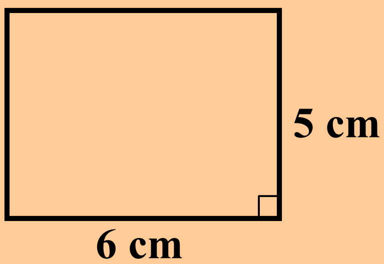

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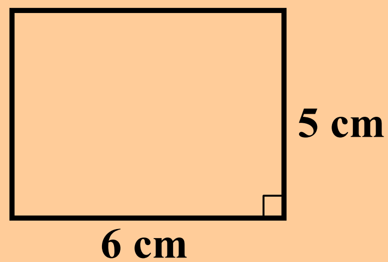

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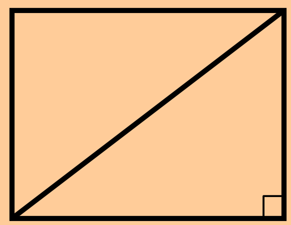

5 cm

6 cm

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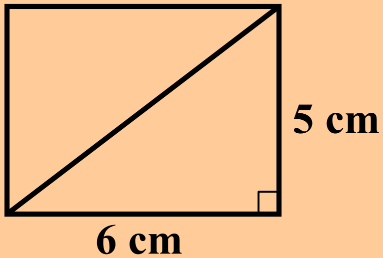

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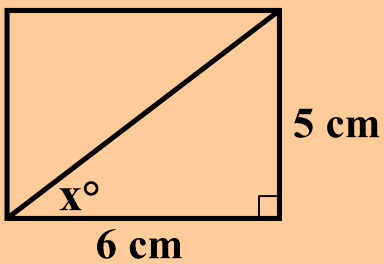

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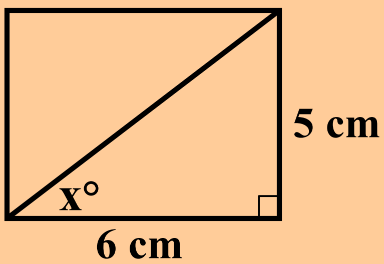

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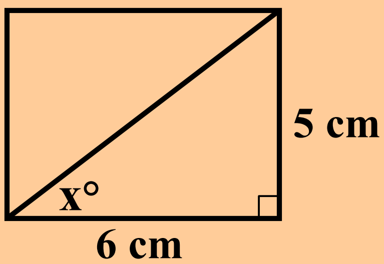

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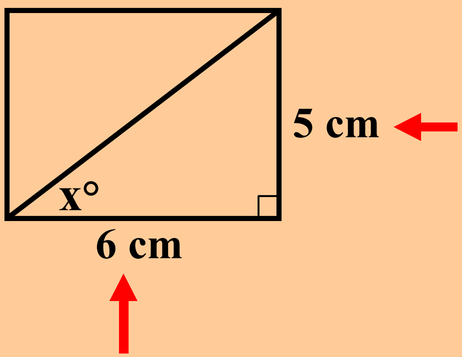

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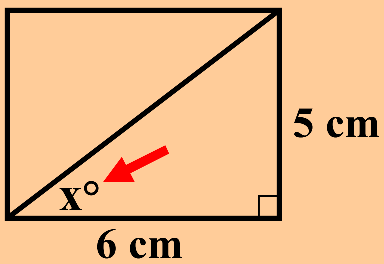

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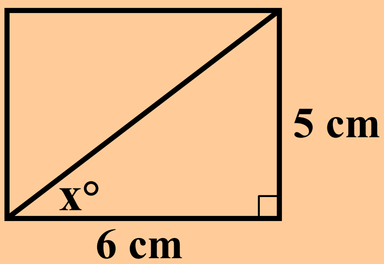

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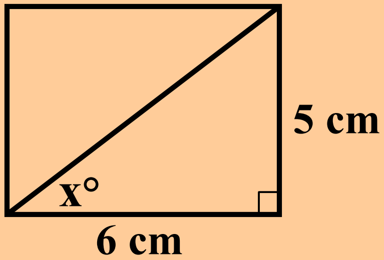

$$\text{tangent of the acute angle} = \frac{\text{length of the opposite leg}}{\text{length of the adjacent leg}}$$

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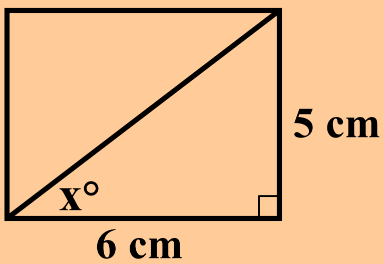

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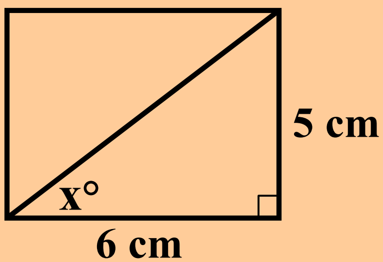

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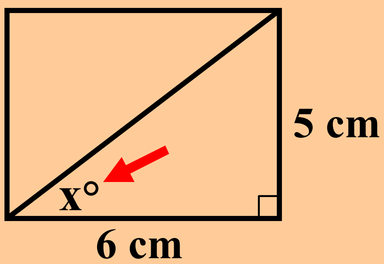

$\tan x° =$

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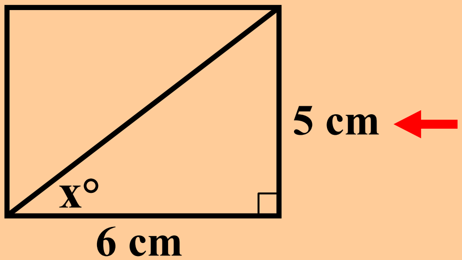

$$\tan x° = \frac{5}{}$$

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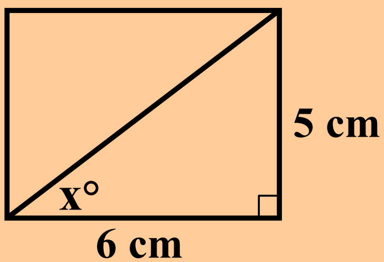

$$\tan x^\circ = \frac{5}{6}$$

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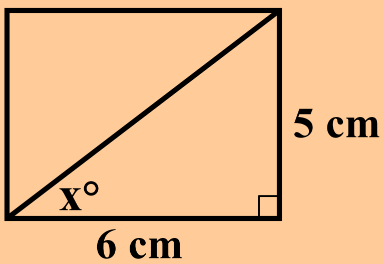

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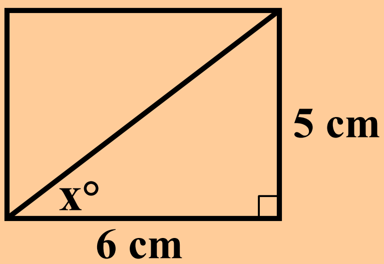

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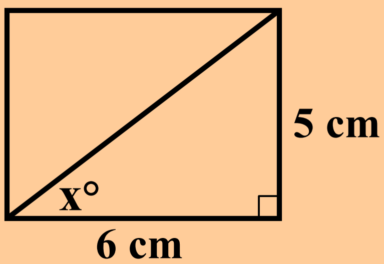

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$x =$

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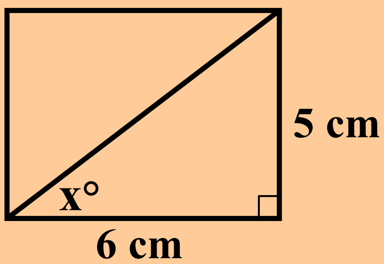

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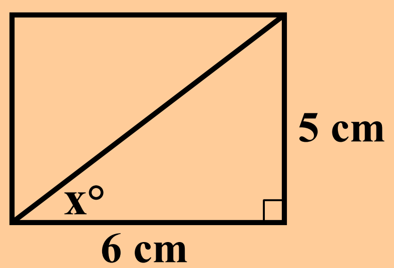

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$$x = \tan^{-1}(5/6)$$

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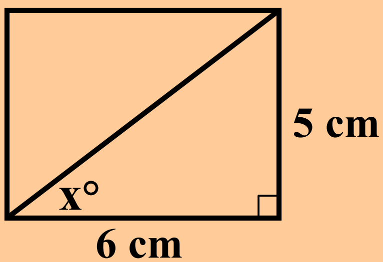
Step 4: Solve for x and answer the question (complete sentence).

General Algebra II CWS #2 Unit 13

Solve each of the following problems. Show your complete solution, including an appropriate diagram, neatly organized in the space provided.

4. A rectangle is 6 centimeters long and 5 centimeters wide. If a diagonal of the rectangle is drawn, then what is the angle between the diagonal and the longer side of the rectangle?

Given the lengths of the two legs of a right triangle, find the measure of an acute angle using the tangent ratio.



$$\tan x° = \frac{5}{6}$$

$$x = \tan^{-1}(5/6)$$

$$x \approx$$

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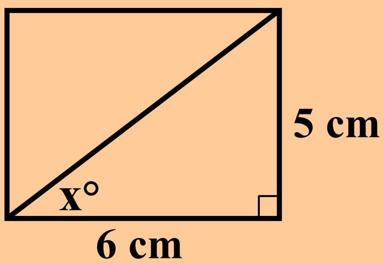

$$\tan x° = \frac{5}{6}$$

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$$x \approx 40°$$

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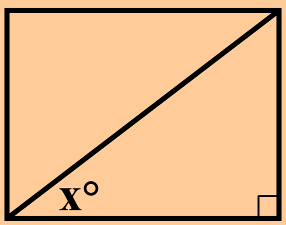

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The angle is about 40 degrees.

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General Algebra II   CWS #2   Unit 13

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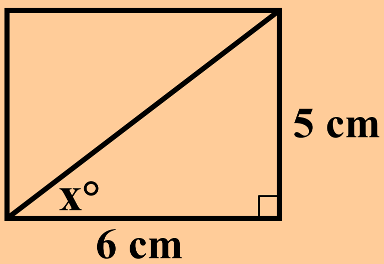

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General Algebra II CWS #2 Unit 13

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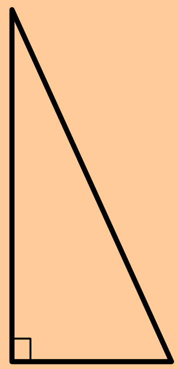

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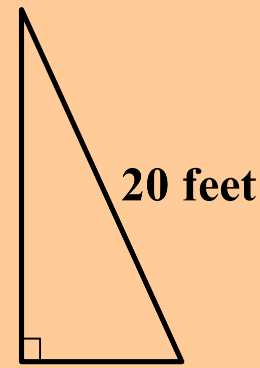

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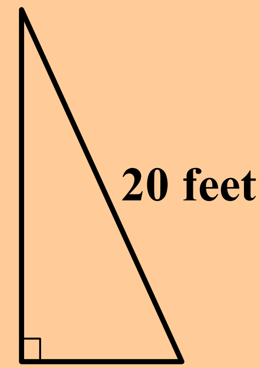

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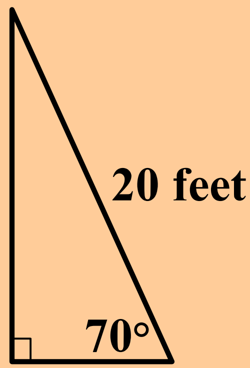

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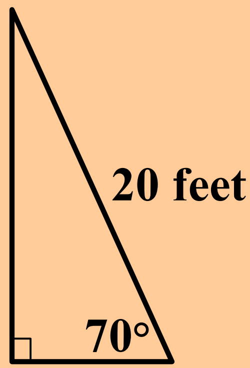

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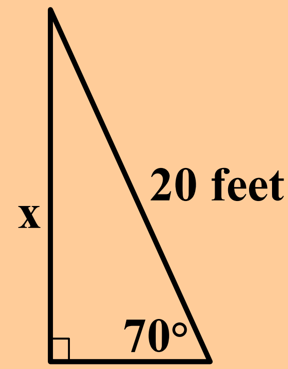

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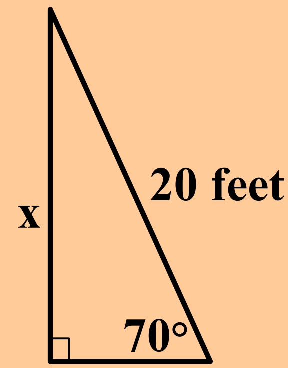

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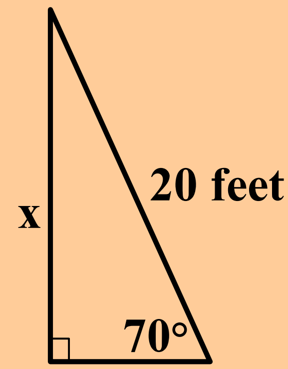

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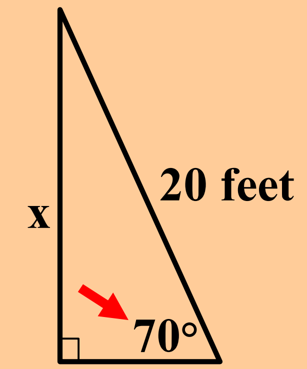
Given the measure of an acute angle



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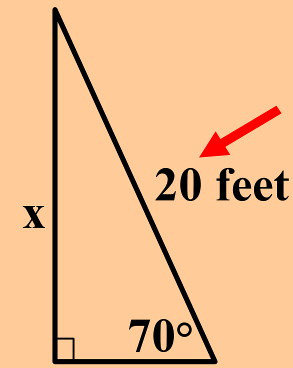
Given the measure of an acute angle and the length of the hypotenuse,



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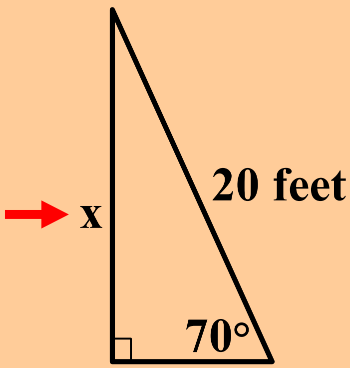

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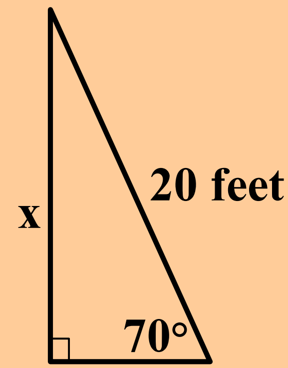

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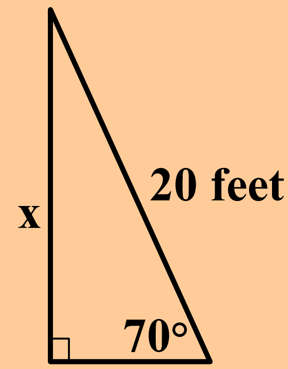

$$\text{sine of the acute angle} = \frac{\text{length of the opposite leg}}{\text{length of the hypotenuse}}$$

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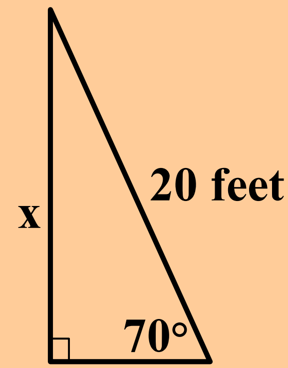

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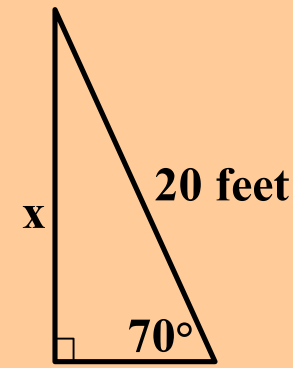

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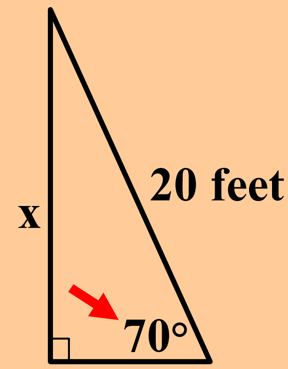

$\sin 70° =$

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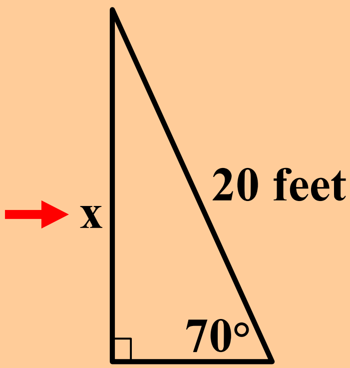

$$\sin 70° = \frac{x}{}$$

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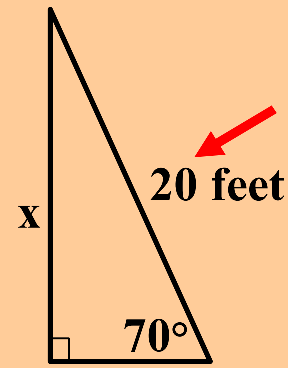

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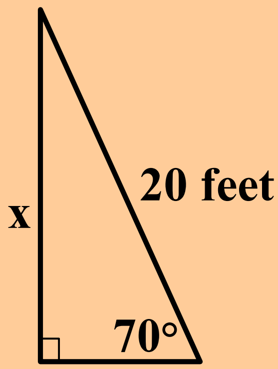

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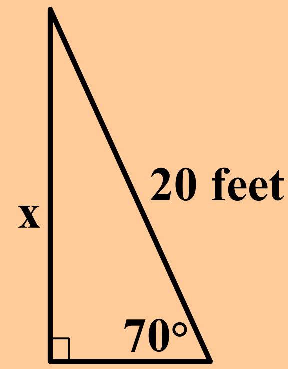

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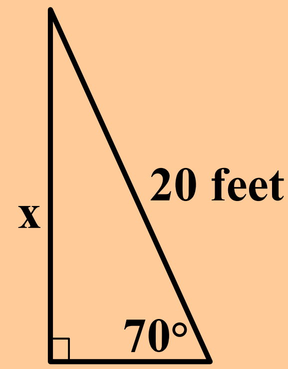

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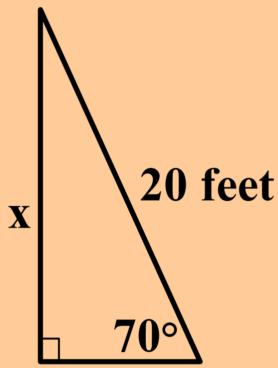

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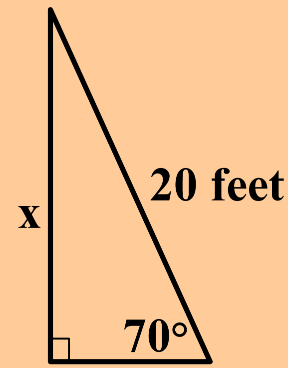
General Algebra II CWS #2 Unit 13

Solve each of the following problems. Show your complete solution, including an appropriate diagram, neatly organized in the space provided.

5. A ladder that is 20 feet long leans up against a vertical wall. If the ladder makes an angle of 70 degrees with the level ground, then how far up the wall does the ladder extend?

Given the measure of an acute angle and the length of the hypotenuse, find the length of the leg opposite the acute angle using the sine ratio.



$$\sin 70° = \frac{x}{20}$$

$$x = 20 \sin 70°$$

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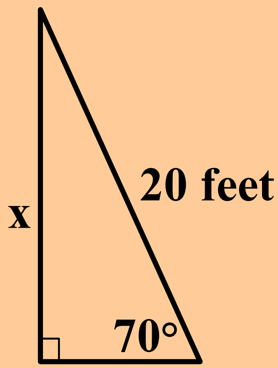

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$$x \approx$$

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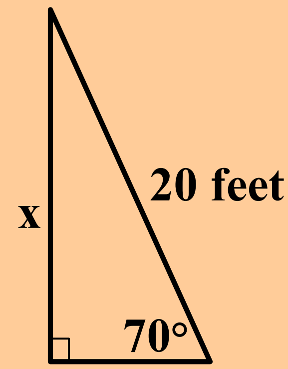

Given the measure of an acute angle and the length of the hypotenuse, find the length of the leg opposite the acute angle using the sine ratio.

$$\sin 70° = \frac{x}{20}$$

$$x = 20 \sin 70°$$

$$x \approx 18.8$$

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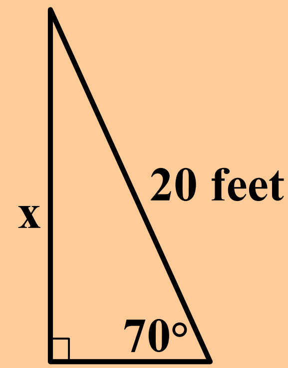

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The ladder extends about 18.8 feet up the wall.

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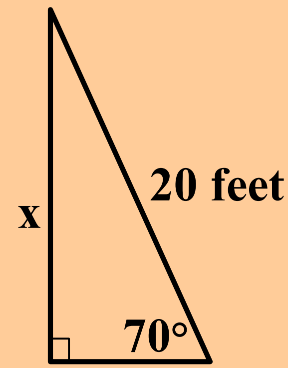

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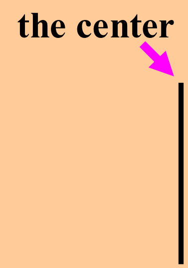

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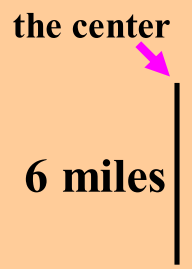

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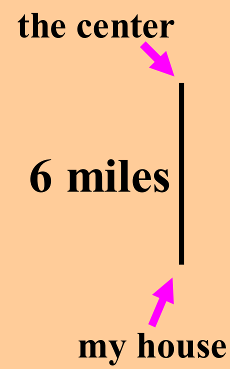

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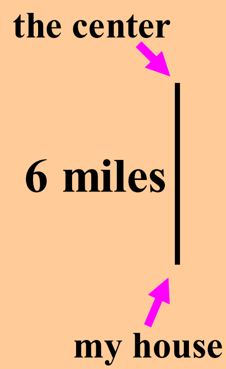

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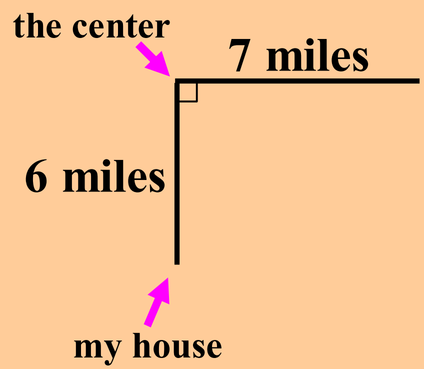

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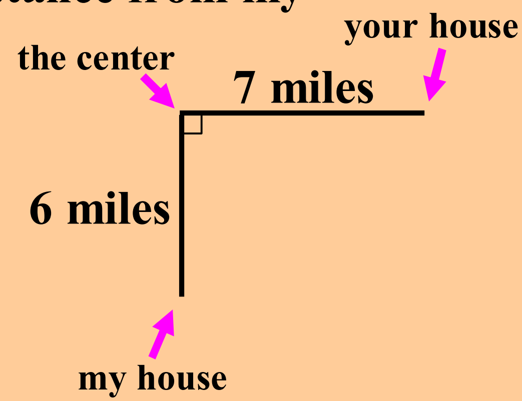

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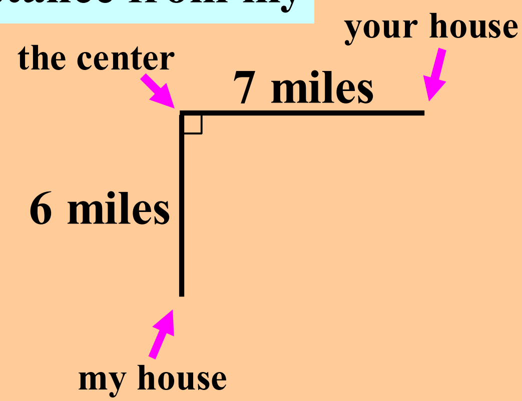

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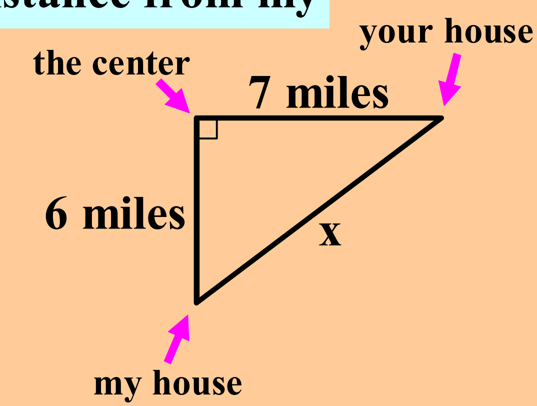

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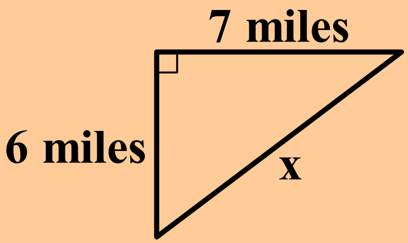

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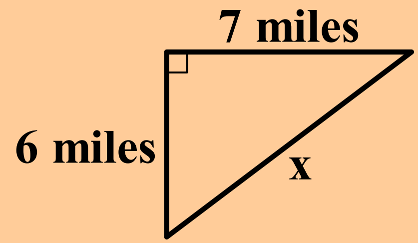

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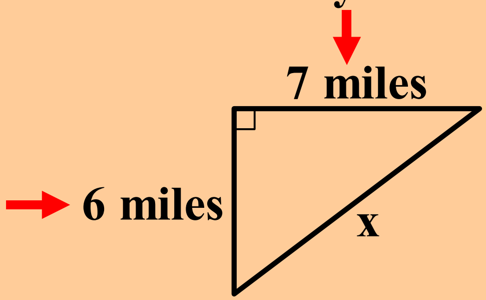
Given the length of each leg,



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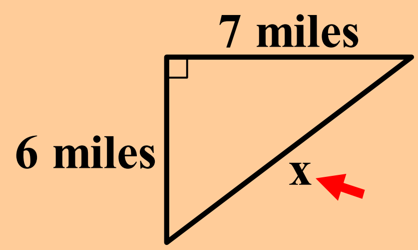
Given the length of each leg, find the length of the hypotenuse



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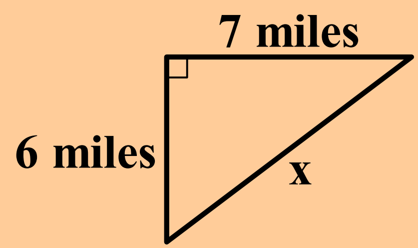
6. My house is located 6 miles due south of 'the center'. Your house is located 7 miles due east of 'the center'. What is the straight line distance from my house to your house?

Given the length of each leg, find the length of the hypotenuse using the Pythagorean theorem.



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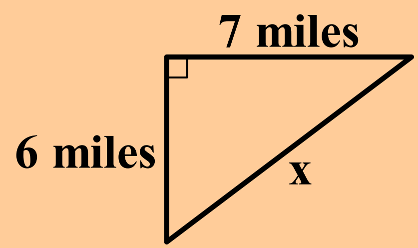
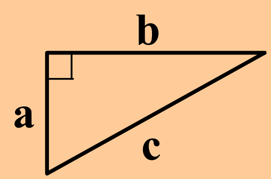


Given the length of each leg, find the length of the hypotenuse using the Pythagorean theorem.

$$c^2 = a^2 + b^2$$



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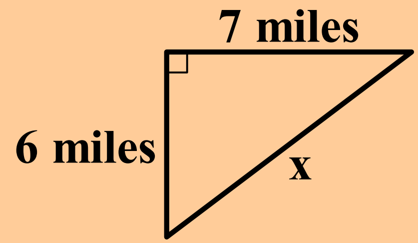

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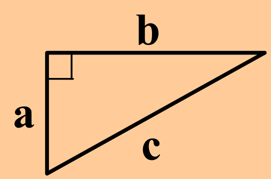

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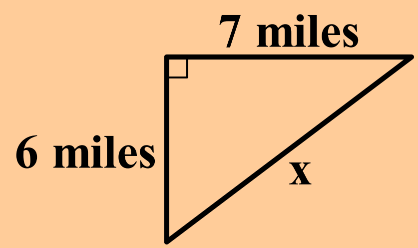

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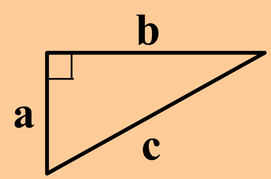

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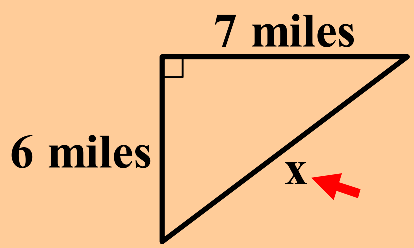

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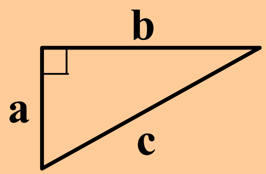
$x^2 =$

$c^2 = a^2 + b^2$



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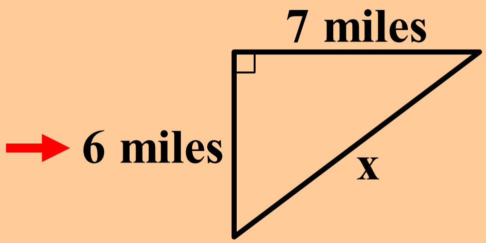
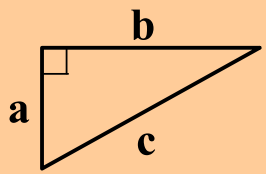


$x^2 = 36$

$c^2 = a^2 + b^2$



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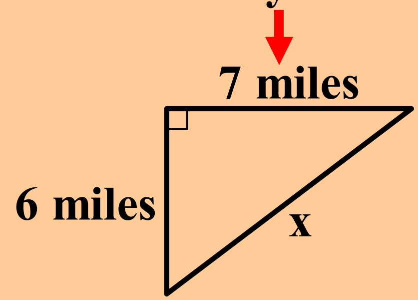
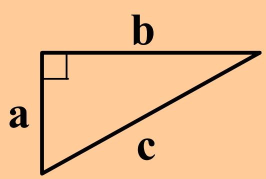


Given the length of each leg, find the length of the hypotenuse using the Pythagorean theorem.

$$x^2 = 36 + 49$$

$$c^2 = a^2 + b^2$$



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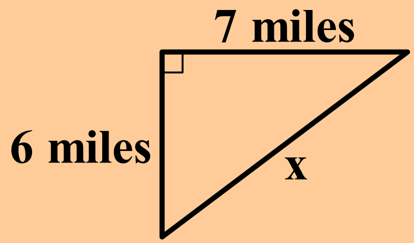

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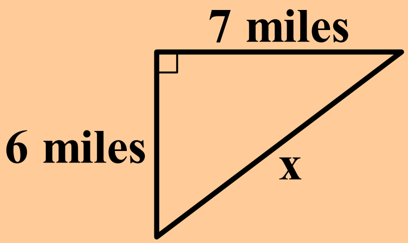
General Algebra II   CWS #2   Unit 13

Solve each of the following problems. Show your complete solution, including an appropriate diagram, neatly organized in the space provided.

6. My house is located 6 miles due south of ‘the center’. Your house is located 7 miles due east of ‘the center’. What is the straight line distance from my house to your house?



Given the length of each leg, find the length of the hypotenuse using the Pythagorean theorem.

$$x^2 = 36 + 49$$

Step 1: Draw a diagram for the problem, using the variable x for the unknown.

Step 2: Analyze the problem and determine the key relationship needed to solve it.

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General Algebra II   CWS #2   Unit 13

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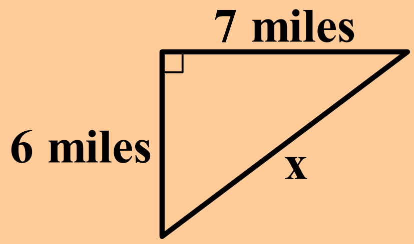

Given the length of each leg, find the length of the hypotenuse using the Pythagorean theorem.

$$x^2 = 36 + 49$$

$$x^2 =$$

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General Algebra II CWS #2 Unit 13

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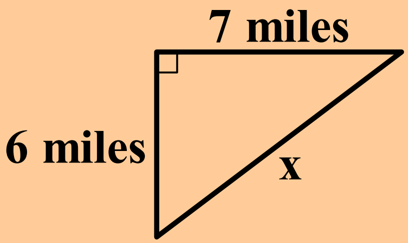

Given the length of each leg, find the length of the hypotenuse using the Pythagorean theorem.

$$x^2 = 36 + 49$$

$$x^2 = 85$$

Step 1: Draw a diagram for the problem, using the variable x for the unknown.

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General Algebra II CWS #2 Unit 13

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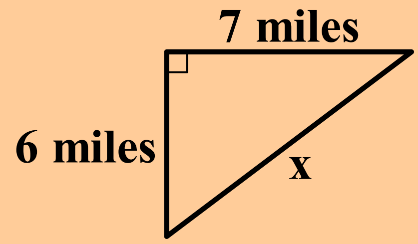

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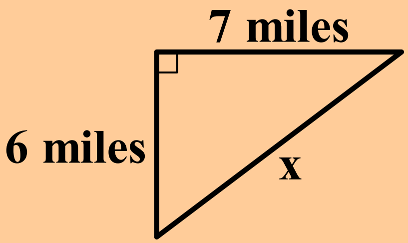

$$x^2 = 36 + 49$$

$$x^2 = 85$$

$$x = \sqrt{85}$$

Step 1: Draw a diagram for the problem, using the variable x for the unknown.

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General Algebra II   CWS #2   Unit 13

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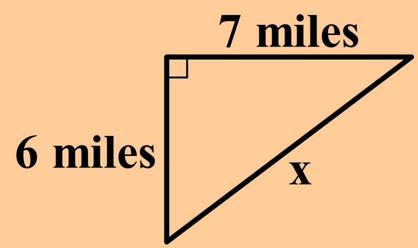

Given the length of each leg, find the length of the hypotenuse using the Pythagorean theorem.

$$x^2 = 36 + 49$$

$$x^2 = 85$$

$$x = \sqrt{85}$$

(Ignore the negative solution.)

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General Algebra II   CWS #2   Unit 13

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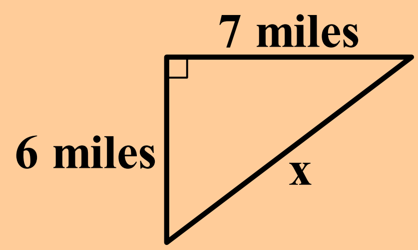

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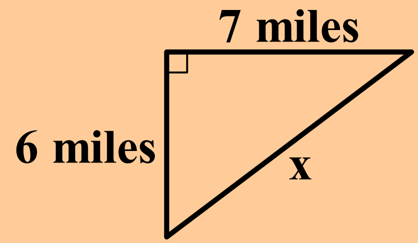

Given the length of each leg, find the length of the hypotenuse using the Pythagorean theorem.

$x^2 = 36 + 49$

$x^2 = 85$

$x = \sqrt{85}$

$x \approx$

Step 1: Draw a diagram for the problem, using the variable x for the unknown.

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General Algebra II CWS #2 Unit 13

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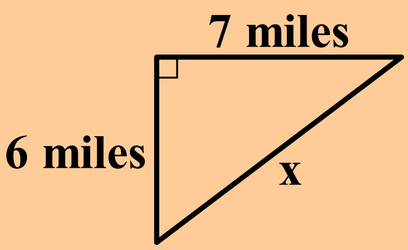

$$x^2 = 36 + 49$$

$$x^2 = 85$$

$$x = \sqrt{85}$$

$$x \approx 9.2$$

Step 1: Draw a diagram for the problem, using the variable x for the unknown.

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General Algebra II CWS #2 Unit 13

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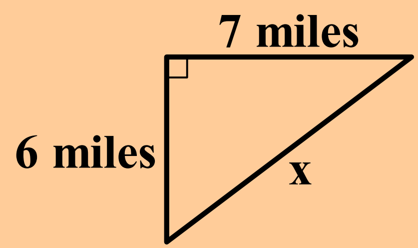

$$x^2 = 36 + 49$$

$$x^2 = 85$$

$$x = \sqrt{85}$$

$$x \approx 9.2$$

The distance is about 9.2 miles.

Step 1: Draw a diagram for the problem, using the variable x for the unknown.

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Step 4: Solve for x and answer the question (complete sentence).

General Algebra II CWS #2 Unit 13

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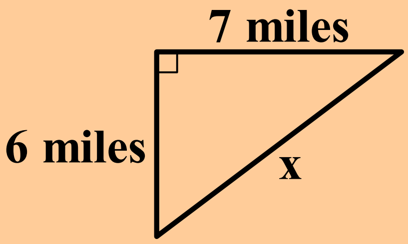

$$x^2 = 36 + 49$$

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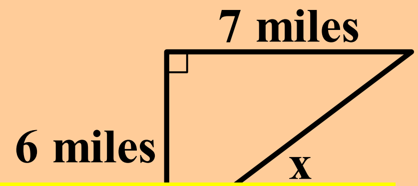

Given the length of each leg, find the length of the hypotenuse using the Pythagorean theorem.

Good luck on worksheet #3.

The distance is about 9.2 miles.

$x = \sqrt{85}$

$x \approx 9.2$

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