

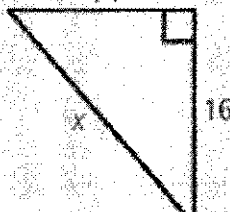
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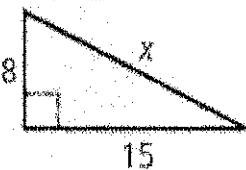
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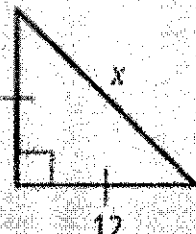
Unit 7: Right Triangles and Trigonometry Study Guide

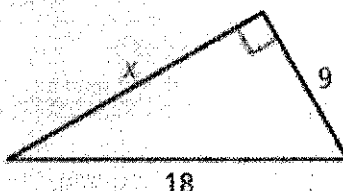
LT#1: Use the Pythagorean Theorem and its converse.

Find the value of x . If your answer is not an integer, express it in simplest radical form.

1.  $14^2 + 16^2 = x^2$
 $196 + 256 = x^2$
 $452 = x^2$
 $2\sqrt{113} = x$

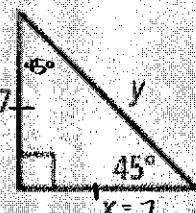
2.  $8^2 + 15^2 = x^2$
 $64 + 225 = x^2$
 $289 = x^2$
 $17 = x$

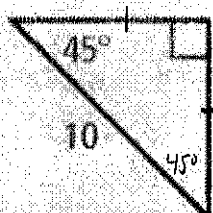
3.  $12^2 + 12^2 = x^2$
 $144 + 144 = x^2$
 $288 = x^2$
 $12\sqrt{2} = x$

4.  $x^2 + 9^2 = 18^2$
 $x^2 + 81 = 324$
 $x^2 = 243$
 $x = 9\sqrt{3}$

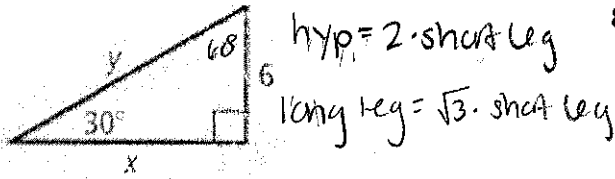
LT#2: Use the properties of 45-45-90 and 30-60-90 triangles.

Find the value of each variable. If your answer is not an integer, express it in simplest radical form.

5.  $\text{hyp} = \sqrt{2} \cdot \text{leg}$
 $y = \sqrt{2} \cdot 7$
 $y = 7\sqrt{2}$
 $x = 7$

6.  $\text{hyp} = \sqrt{2} \cdot \text{leg}$
 $10 = \sqrt{2} \cdot x$
 $\frac{10}{\sqrt{2}} = \frac{\sqrt{2} \cdot x}{\sqrt{2}}$
 $\frac{10}{\sqrt{2}} = x$
 $x = \frac{10\sqrt{2}}{2}$
 $x = 5\sqrt{2}$

7.



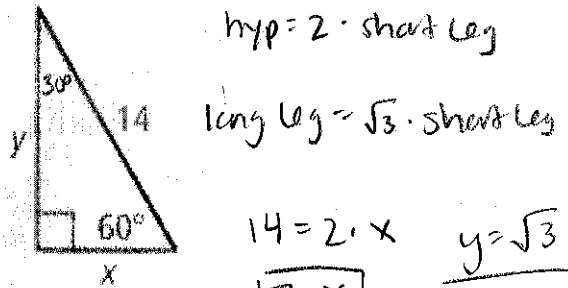
$$y = 2 \cdot 6$$

$$\boxed{y = 12}$$

$$x = \sqrt{3} \cdot 6$$

$$\boxed{x = 6\sqrt{3}}$$

8.



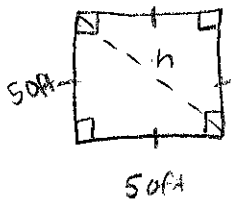
$$14 = 2 \cdot x$$

$$\boxed{7 = x}$$

$$y = \sqrt{3} \cdot 7$$

$$\boxed{y = 7\sqrt{3}}$$

9. A square garden has sides 50 ft long. You stretch a hose from one corner of the garden to another corner along the garden's diagonal. To the nearest tenth, how long is the hose?



$$\text{hyp} = \sqrt{2} \cdot \text{leg}$$

$$h = \sqrt{2} \cdot 50$$

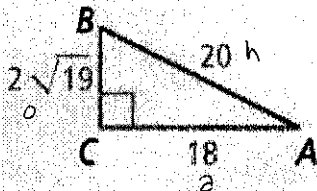
$$h = 50\sqrt{2} \approx \boxed{70.7 \text{ ft}}$$

LT#3: Use the sine, cosine, and tangent ratios to determine side lengths and angle measures in right triangles.

LT#4: Use angles of elevation and depression to solve problems.

Express $\sin A$, $\cos A$, and $\tan A$ as ratios.

10.

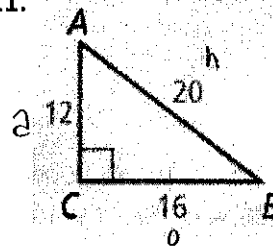


$$\sin A = \frac{2\sqrt{19}}{20} = \frac{\sqrt{19}}{10}$$

$$\cos A = \frac{18}{20} = \frac{9}{10}$$

$$\tan A = \frac{2\sqrt{19}}{18} = \frac{\sqrt{19}}{9}$$

11.



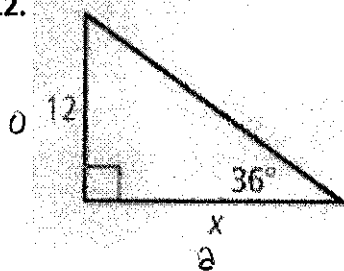
$$\sin A = \frac{16}{20} = \frac{4}{5}$$

$$\cos A = \frac{12}{20} = \frac{3}{5}$$

$$\tan A = \frac{16}{12} = \frac{4}{3}$$

Find the value of x to the nearest tenth.

12.

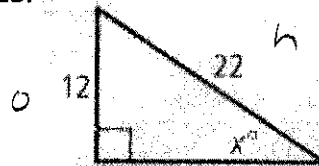


$$\tan 36^\circ = \frac{12}{x}$$

$$x = \frac{12}{\tan 36}$$

$$x = 16.5$$

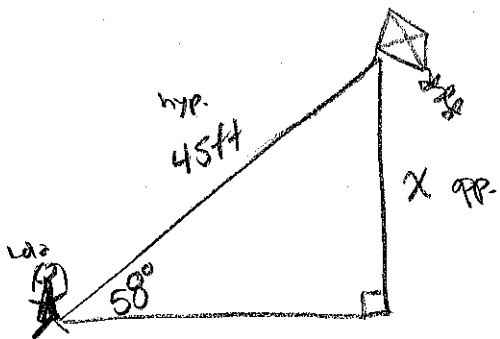
13.



$$\sin x = \frac{12}{22}$$

$$x = \sin^{-1}\left(\frac{12}{22}\right) \approx 33.1^\circ$$

14. While flying a kite, Lola lets out 45 ft of string and anchors it to the ground. She determine that the angle of elevation of the kite is 58° . What is the height of the kite from the ground? Round to the nearest tenth.



$$\sin 58^\circ = \frac{x}{45}$$

$$x = 45 \sin 58^\circ$$

$$x = 38.2 \text{ ft}$$