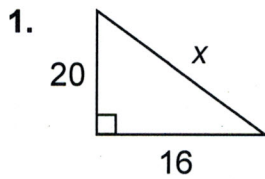


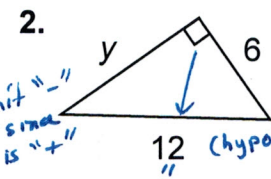
The Right Triangle Review

Find the missing side of each right triangle. Leave your answer in simplest radical form.



$\therefore x = \sqrt{4^2 + 4^2} \approx 25.6$

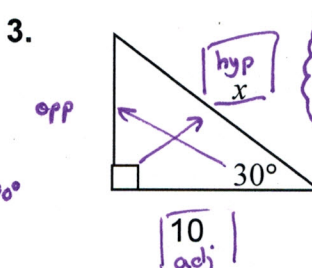
$a^2 + b^2 = c^2 \rightarrow$  Pythagorean Equation  
 $(20)^2 + (16)^2 = c^2$   
 $400 + 256 = c^2$   
 $656 = c^2$   
 $\sqrt{656} = c$   
 $\sqrt{2^4 \cdot 41} = c$   
 $2^2 \sqrt{41} = c$



$\therefore y = \sqrt{6^2 - 12^2} \approx 10.4$

$a^2 + b^2 = c^2$   
 $a^2 + (6)^2 = (12)^2$   
 $a^2 + 36 = 144$   
 $a^2 = 108$   
 $a = \sqrt{108}$   
 $= \sqrt{36 \cdot 3}$   
 $= \sqrt{6 \cdot 3}$

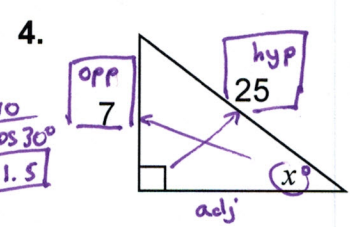
Find the value of x. Round answers to the nearest tenth.



\* An alternate solution utilizes properties of a special right triangle, namely 30°-60°-90°

SOH CAH TOA  
 $\sin \theta = \frac{\text{opp}}{\text{hyp}}$   
 $\cos \theta = \frac{\text{adj}}{\text{hyp}}$   
 $\tan \theta = \frac{\text{opp}}{\text{adj}}$

$\cos 30^\circ = \frac{10}{x}$   
 $\cos 30^\circ \approx \frac{10}{x}$   
 $x \cdot \cos 30^\circ = 10$   
 $\frac{x \cdot \cos 30^\circ}{\cos 30^\circ} = \frac{10}{\cos 30^\circ}$



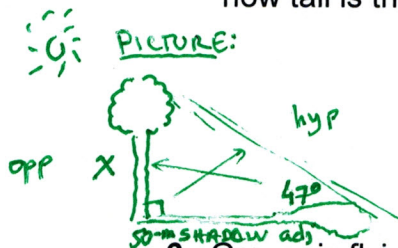
$\therefore x = \frac{10}{\cos 30^\circ} \approx 11.5$

\* make sure to enter degree symbol on Nspire

$\sin x^\circ = \frac{7}{25}$   
 $\sin^{-1}(\sin x^\circ) = \sin^{-1}(\frac{7}{25})$   
 $x = \sin^{-1}(\frac{7}{25})$   
 $= 16.3$   
 $\therefore x = 16.3^\circ$   
 \* make sure your calculator is in degree mode

Draw a picture, write an equation, and solve the problem. Round answers to the nearest tenth.

5. A tree casts a 50-m shadow. If the sun's rays form a 47° angle with the ground, how tall is the tree?

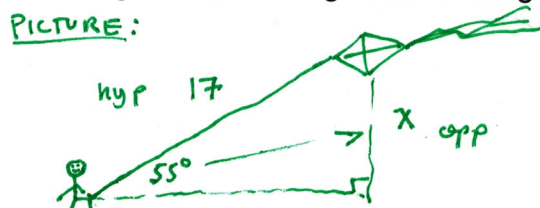


Picture: EQUATION:  
 $\tan 47^\circ = \frac{x}{50}$

Solve:  
 $\tan 47^\circ \approx \frac{x}{50}$   
 $50 \cdot \tan 47^\circ = x$   
 $53.6 = x$

Conclusion:  
 The tree is 53.6 m tall.

6. Grover is flying a kite with a 17-ft string. If the string makes a 55° angle with the ground, how high above the ground is the kite?

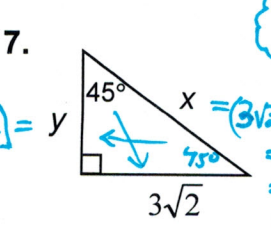


Picture: EQUATION:  
 $\sin 55^\circ = \frac{x}{17}$

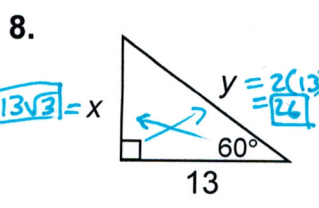
Solve:  
 $\frac{\sin 55^\circ}{1} \approx \frac{x}{17}$   
 $17 \cdot \sin 55^\circ = x$   
 $13.9 = x$

Conclusion:  
 The kite is 13.9 ft above the ground.

Find the value of x and y. Leave your answers in radical form.



45°-45°-90° Property  
 $a \quad a \quad a\sqrt{2}$   
 $x = (3\sqrt{2})\sqrt{2}$   
 $= 3\sqrt{4}$   
 $= 3 \cdot 2$   
 $= 6$



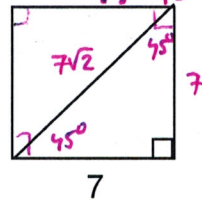
30°-60°-90° Property  
 $a \quad a\sqrt{3} \quad 2a$

$3\sqrt{2} = y$

$13\sqrt{3} = x$

9. Find the diagonal of the square with a side of 7. (Leave your answer in simplest radical form.)

- A.  $7\sqrt{2}$   
 B.  $7\sqrt{3}$   
 C. 14  
 D.  $14\sqrt{2}$   
 E.  $49\sqrt{2}$



10. Find the length of the missing side. (Leave your answer in simplest radical form.)

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

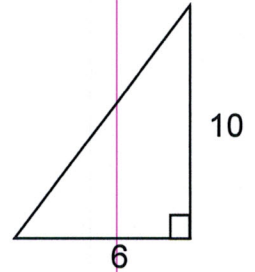
$$6^2 + 10^2 = c^2$$

$$36 + 100 = c^2$$

$$136 = c^2$$

$$\sqrt{4 \cdot 34} = c$$

$$\boxed{2\sqrt{34}} = c$$



Handwritten calculations for problem 10:

$$136 \hat{=} 2 \cdot 68$$

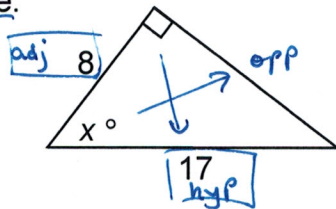
$$2 \cdot 34 \hat{=} 2 \cdot 17$$

$$2^2 \cdot 17$$

$$2^2 \cdot 2 \cdot 17$$

$$4 \cdot 34$$

11. Find the value of  $x$  to the nearest degree.



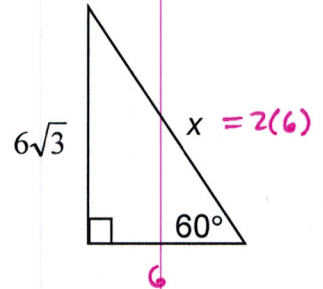
$$\cos x^\circ = \frac{8}{17}$$

$$\cos^{-1}(\cos x^\circ) = \cos^{-1}\left(\frac{8}{17}\right)$$

$$x = \cos^{-1}\left(\frac{8}{17}\right) \approx \boxed{62^\circ}$$

12. Find the value of  $x$ . (Leave your answer in simplest radical form.)

- A. 6  
 B. 16  
 C. 12  
 D. 18  
 E.  $12\sqrt{3}$

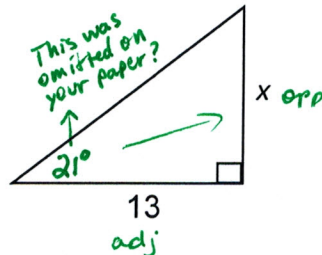


13. Find the value of  $x$  to the nearest tenth.

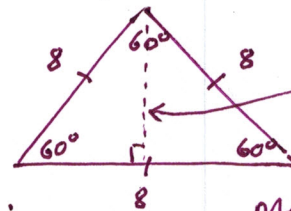
$$\tan 21^\circ = \frac{x}{13}$$

$$13 \cdot \tan 21^\circ = x$$

$$\boxed{5.0 = x}$$



14. Find the area of an equilateral triangle whose perimeter is 24. (Leave your answer in simplest radical form.)



$$\frac{24}{3} = 8$$

Method 1:

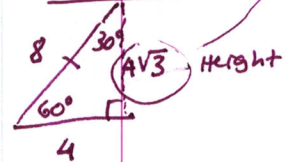
$$A = \frac{s^2\sqrt{3}}{4}$$

$$= \frac{8^2\sqrt{3}}{4}$$

$$= \frac{64\sqrt{3}}{4}$$

$$= \boxed{16\sqrt{3} \text{ units}^2}$$

Method 2:

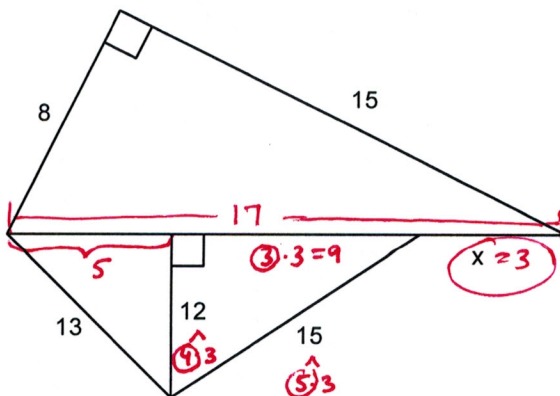


$$A = \frac{1}{2}bh$$

$$= \frac{1}{2}(8)4\sqrt{3}$$

$$= \boxed{16\sqrt{3} \text{ units}^2}$$

15. Solve for  $x$ .



Pythagorean Triples

- (3, 4, 5)
- (5, 12, 13)
- (8, 15, 17)
- (7, 24, 25)
- (9, 40, 41)

