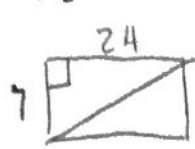


Right Triangle Review

Name: _____

- 1) The dimensions of a rectangle are 7 centimeters by 24 centimeters. Find, in centimeters, the length of the diagonal of this rectangle.



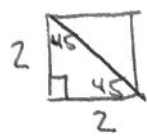
$$7^2 + 24^2 = C^2$$

$$49 + 576 = C^2$$

$$\sqrt{625} = \sqrt{C^2}$$

$$25 = C$$

- 2) Find, in simplest radical form, the length of a diagonal of a square whose side is 2.



$$45-45-90 \Delta$$

$$2\sqrt{2}$$

- 3) Triangle ABC is a right triangle with legs that measure 7 and 8. The length of the hypotenuse is

- A) 9
B) 19

- C) $\sqrt{15}$
D) $\sqrt{113}$

$$7^2 + 8^2 = C^2$$

- 4) If the hypotenuse of a right triangle measures 8 and one leg measures 5, then the other leg measures

- A) $\sqrt{39}$
B) $\sqrt{13}$

- C) $\sqrt{3}$
D) $\sqrt{89}$

$$a^2 + 5^2 = 8^2$$

- 5) What is the length of the altitude of an equilateral triangle whose side has length 4?

- A) 2
B) 4

- C) $4\sqrt{3}$
D) $2\sqrt{3}$



$$2^2 + x^2 = 4^2$$

- 6) Which set of numbers may represent the lengths of the sides of a right triangle?

- A) {4,5,6}
B) {5,12,13}

- C) {5,5,10}
D) {7,8,10}

- 7) The length of a side of a rhombus whose diagonals are 6 and 8 is

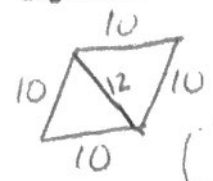
- A) 9
B) 5

- C) 6
D) 8

$$3^2 + 4^2 = C^2$$



- 8) The perimeter of a rhombus is 40 and the shorter diagonal is 12. Find the length of the longer diagonal.

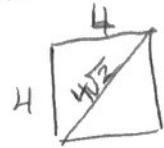


$$6^2 + b^2 = 10^2$$

$$b = 8$$

longer diagonal = 16

- 9) If the diagonal of a square has a length of $4\sqrt{2}$, find the perimeter.



$$P = 16$$

- 10) In a right triangle, the length of the longer leg is 2 more than the length of the shorter leg. The length of the hypotenuse is 2 less than twice the length of the shorter leg. Find the lengths of the sides of the triangle.

- 11) If $\sin(x + 20^\circ) = \cos x$, then the value of x is

- A) 70
B) 55

- C) 35
D) 45

$$x + 20 + x = 90$$

- 12) If $\cos(2x - 1)^\circ = \sin(3x + 6)^\circ$, then the value of x is

- A) 17
B) -7

- C) 71
D) 35

$$2x - 1 + 3x + 6 = 90$$

$$5x + 5 = 90$$

$$5x = 85$$

$$x = 17$$

13) Which value of x satisfies the equation $\sin(3x + 5)^\circ = \cos(4x + 1)^\circ$?

- A) 12 C) 24
 B) 30 D) 4

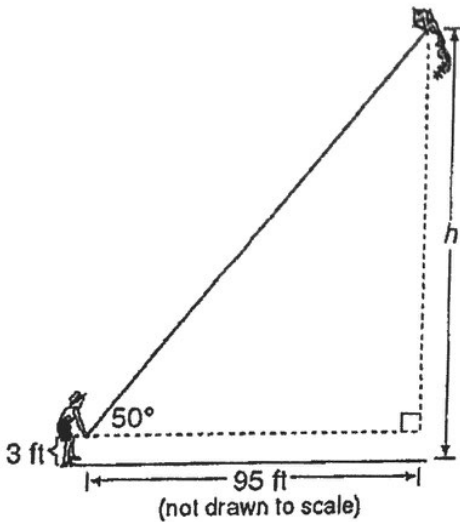
$$3x + 5 + 4x + 1 = 90$$

$$7x + 6 = 90$$

14) What is the degree measure of an acute angle θ if $\sin 20^\circ = \cos \theta$?

$$\theta = 70^\circ$$

15) Joe is holding his kite string 3 feet above the ground, as shown in the accompanying diagram. The distance between his hand and a point directly under the kite is 95 feet.

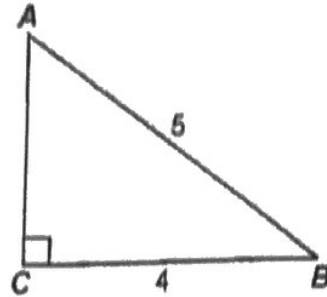


If the angle of elevation to the kite is 50° , find the height, h , of his kite, to the nearest foot.

$$\tan 50 = \frac{h}{95} \quad h = 113$$

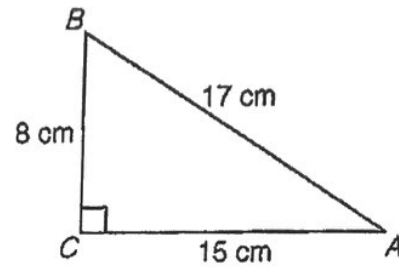
$$\begin{array}{r} 113 \\ + 3 \\ \hline 116 \text{ ft} \end{array}$$

16) Which equation could be used to find the measure of one acute angle in the right triangle shown below?



- A) $\tan A = \frac{3}{4}$ C) $\tan B = \frac{4}{3}$
 B) $\sin A = \frac{4}{5}$ D) $\cos B = \frac{5}{4}$

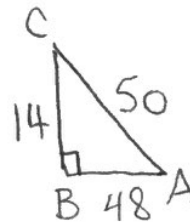
17) Which equation shows a correct trigonometric ratio for angle A in the right triangle below?



- A) $\tan A = \frac{15}{8}$ C) $\sin A = \frac{15}{17}$
 B) $\cos A = \frac{15}{17}$ D) $\tan A = \frac{8}{17}$

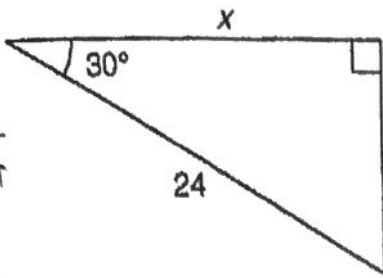
18) In $\triangle ABC$, the measure of $\angle B = 90^\circ$, $AC = 50$, $AB = 48$, and $BC = 14$. What ratio represents the tangent of $\angle A$?

- A) $\frac{48}{50}$ C) $\frac{48}{14}$
 B) $\frac{14}{15}$ D) $\frac{14}{48}$



19) In the right triangle below, what is the value of x to the nearest whole number?

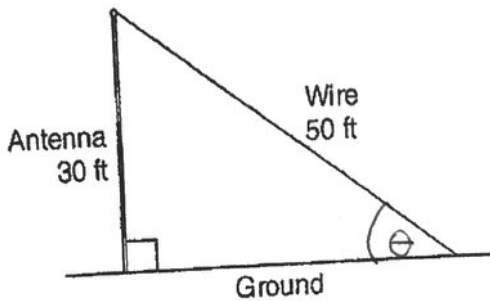
$$\cos 30 = \frac{x}{24}$$



- A) 21
- B) 12

- C) 14
- D) 28

20) A communications company is building a 30-foot antenna to carry cell phone transmissions. As shown in the diagram below, a 50-foot wire from the top of the antenna to the ground is used to stabilize the antenna.



Find, to the nearest degree, the measure of the angle that the wire makes with the ground. [Show all work.]

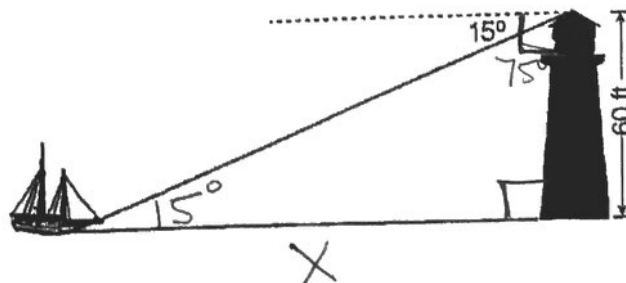
$$\sin \theta = \frac{30}{50} \rightarrow \theta = 37^\circ$$

22) As shown in the accompanying diagram, a ship at sea is sighted from the top of a 60-foot lighthouse. If the angle of depression of the ship from the top of the lighthouse measures 15° , find, to the nearest foot, how far the ship is from the base of the lighthouse.

$$\tan 15 = \frac{60}{x}$$

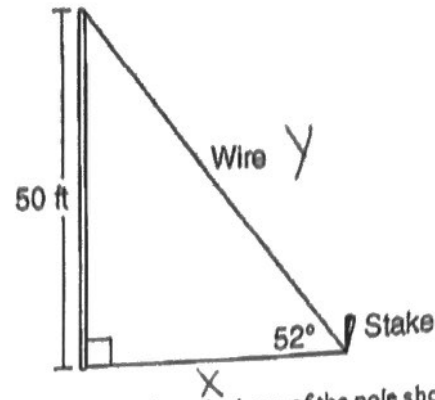
$$x \cdot \tan 15 = \frac{60}{\tan 15}$$

$$x = 224 \text{ ft}$$



21)

A stake is to be driven into the ground away from the base of a 50-foot pole, as shown in the diagram below. A wire from the stake on the ground to the top of the pole is to be installed at an angle of elevation of 52° .



- (a) How far away from the base of the pole should the stake be driven in, to the nearest foot? [Show all work.]
- (b) What will be the length of the wire from the stake to the top of the pole, to the nearest foot? [Show all work.]

$$a) \tan 52 = \frac{50}{x}$$

$$x \tan 52 = \frac{50}{\tan 52}$$

$$x = 39 \text{ ft}$$

$$b) \sin 52 = \frac{50}{y}$$

$$y \sin 52 = \frac{50}{\sin 52}$$

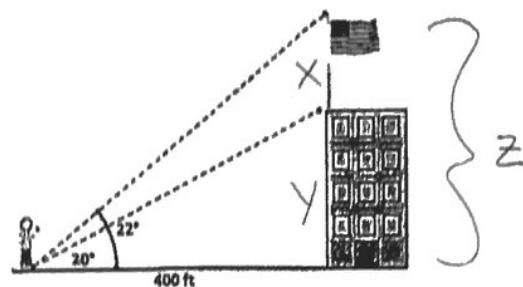
$$y = 63 \text{ ft}$$

23. A flagpole is at the top of a building. 400 ft from the base of the building, the angle of elevation of the top of the pole is 22° and the angle of elevation of the bottom of the pole is 20° . Determine the length of the flagpole (to the nearest foot).

$$\textcircled{1} \tan 20^\circ = \frac{y}{400} \quad y = 145.58$$

$$\textcircled{2} \tan 22^\circ = \frac{z}{400} \quad z = 161.61$$

$$\textcircled{3} x = 161.61 - 145.58 \approx \boxed{16 \text{ ft}}$$

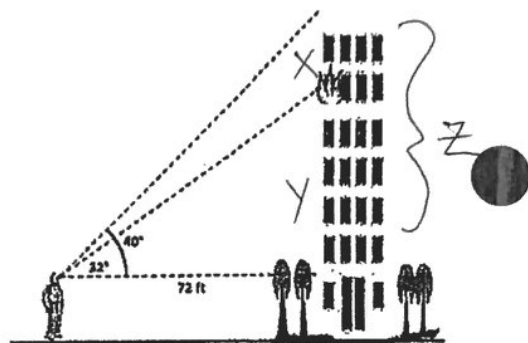


24. A firefighter on the ground sees the fire break through a window. The angle of elevation to the windowsill is 32° . The angle of elevation to the top of the building is 40° . If the firefighter is 72 ft from the building, what is the distance from the roof to the window sill?

$$\textcircled{1} \tan 32^\circ = \frac{y}{72} \quad y = 44.99$$

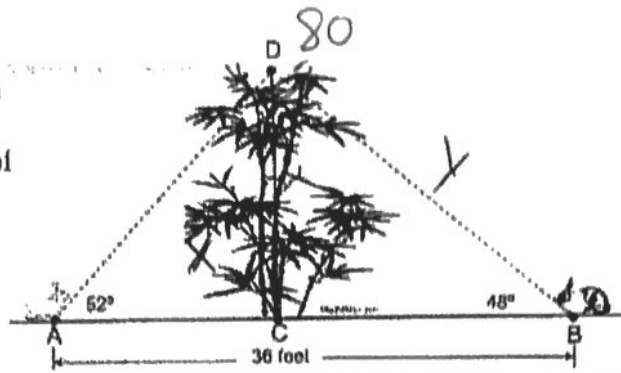
$$\textcircled{2} \tan 40^\circ = \frac{z}{72} \quad z = 60.41$$

$$\textcircled{3} x = 60.41 - 44.99 \approx \boxed{15 \text{ ft}}$$



25.

Rabbit A and rabbit B are sitting 36 feet apart. Between them is their home (rabbit hole C) beneath a bamboo tree. From point A, the angle of elevation of the top of the tree is 52° , and from point B the angle of elevation of the top of the tree is 48° . Find, to the nearest tenth of a foot, the height of the tree.

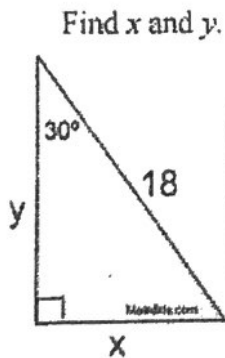


$$\textcircled{1} \frac{\sin 80}{36} = \frac{\sin 52}{y}$$

$$y = 28.80$$

$$\textcircled{2} \sin 48 = \frac{x}{28.80} \quad x = \boxed{21.4 \text{ ft}}$$

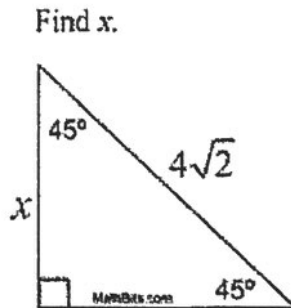
26. Simplest Radical Form



$$x = 9$$

$$y = 9\sqrt{3}$$

27. Simplest Radical Form



$$x = 4$$