

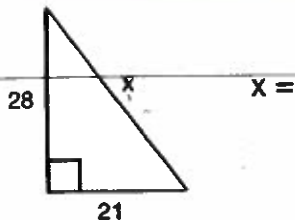
Name: _____

Key

Special Right Triangles (and Trig!) Practice Test

Show ALL work. If you will be using a calculator, show the set-up of problem!

1.



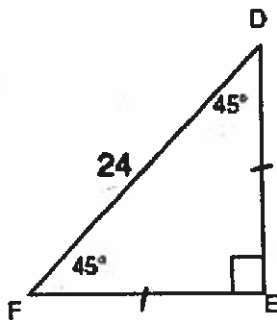
A. $\sqrt{35}$

B. 35

C. $35\sqrt{2}$

D. $35\sqrt{3}$

2. DE =



$$\frac{24}{\sqrt{2}} = \frac{24\sqrt{2}}{2}$$

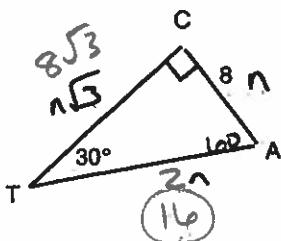
A. 12

B. $12\sqrt{2}$

C. $12\sqrt{3}$

D. 24

3.



AT =

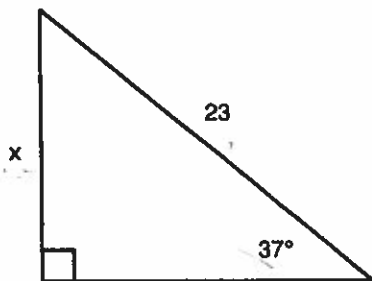
A. 8

B. $8\sqrt{2}$

C. $8\sqrt{3}$

D. 16

4. Find x to two decimal places:



$$\sin 37 = \frac{x}{23}$$

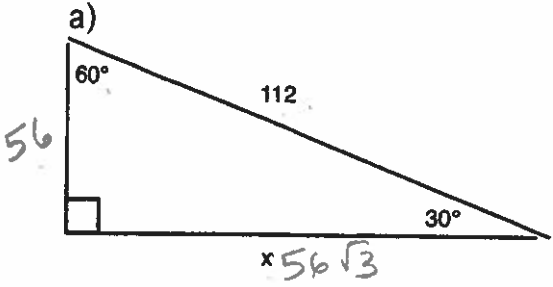
A. 13.84

B. 18.36

C. 18.37

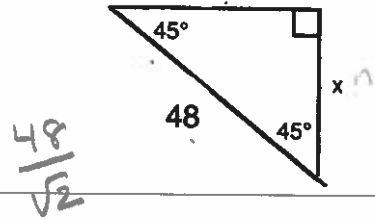
D. 38.22

5. Find x in **simplified radical form**:



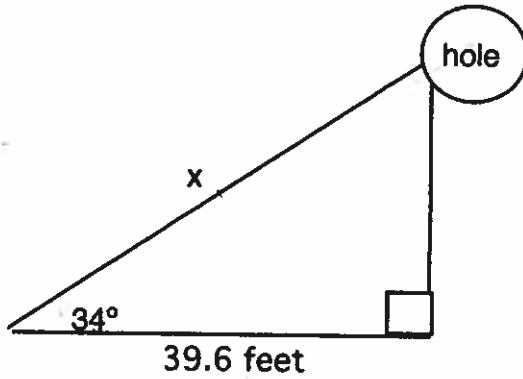
$x = \underline{56\sqrt{3}}$

b)



$x = \underline{24\sqrt{2}}$

6. Find the distance from the golf ball to the hole.

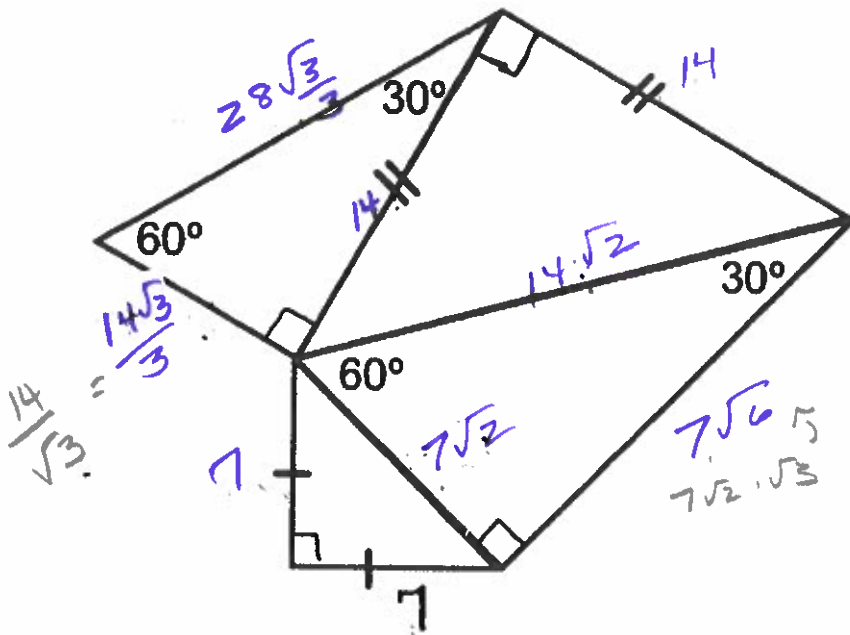


$\cos 34 = \frac{39.6}{x}$

$x = \underline{47.8}$ feet

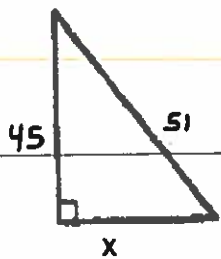
<http://www.psdgraphics.com/file/golf-ball.jpg>

7. Find and label all the missing sides. **SHOW WORK.** No decimals. Use only radicals.



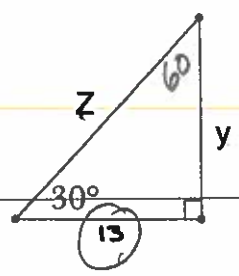
8. Find all the missing sides. Leave your answers in radical form.

a)



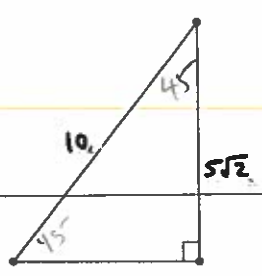
$x = \underline{24}$

b)



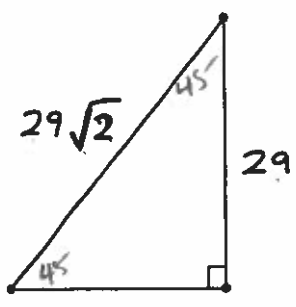
$y = \frac{13\sqrt{3}}{3}$ $z = \frac{26\sqrt{3}}{3}$

c)



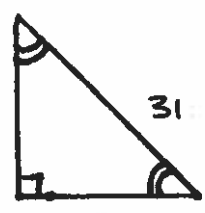
$a = \underline{5\sqrt{2}}$

d)



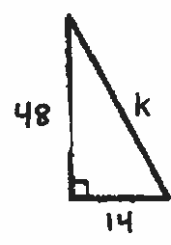
$b = \underline{29}$

e)



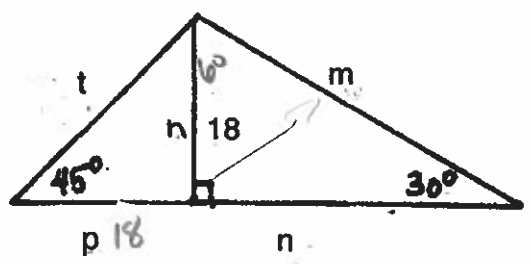
$d = \frac{31\sqrt{2}}{2}$

f)



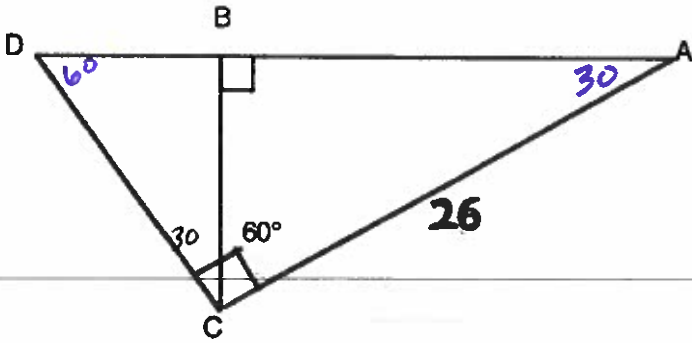
$k = \underline{50}$

9. Find all 4 missing lengths in this shape.



$m = \underline{36}$ $n = \underline{18\sqrt{3}}$
 $p = \underline{18}$ $t = \underline{18\sqrt{2}}$

10.



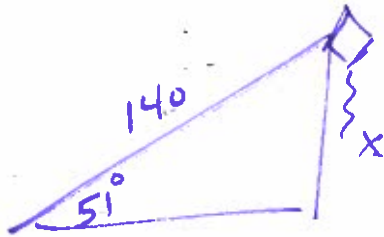
Find:

$$BC = \frac{13}{3} \quad AB = \frac{13\sqrt{3}}{3}$$

$$BD = \frac{13\sqrt{3}}{3} \quad DC = \frac{26\sqrt{3}}{3}$$

$$AD = \frac{52\sqrt{3}}{3}$$

11. Bobby is flying a kite, and the string attached to the kite is 140 feet long. The angle of elevation from Bobby to the kite is 51° . How high is the kite above the ground (straight down from the kite to the ground)? Give your answer to three decimal places.

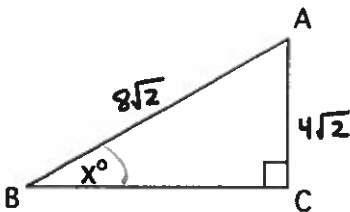


$$\frac{\sin 51}{1} = \frac{x}{140}$$

height = 108.8004 feet

12. Find the missing sides and/or angles.

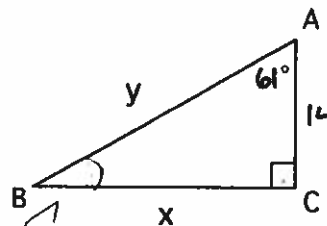
a)



$x = \underline{30}^\circ$

$BC = \underline{4\sqrt{6}}$

b)

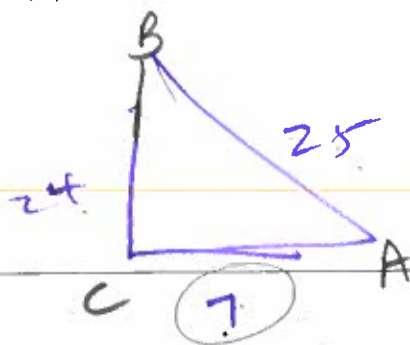


$$\tan 61 = \frac{x}{14}$$

$$\cos 61 = \frac{14}{y}$$

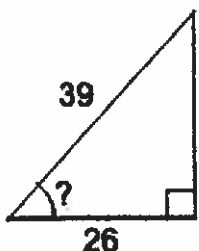
$\angle B = \underline{29}^\circ$ $x = \underline{25.3}$ $y = \underline{28.9}$

13. Given $\sin(A) = \frac{24}{25}$ find $\cos(A)$. Write as a fraction. Hint: Draw the triangle!



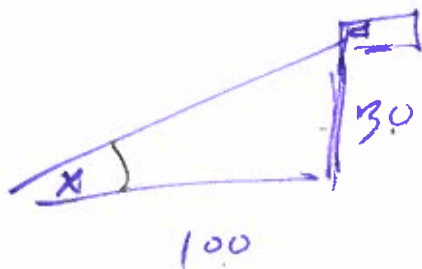
$$\cos \theta = \frac{7}{25}$$

14. Find the missing angle (?) to three decimal places:



$$\cos \theta = \frac{26}{39}$$
$$\cos^{-1} \left(\frac{26}{39} \right)$$
$$48.190^\circ$$

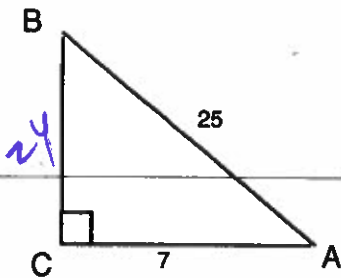
15. You are standing 100 feet from the base of a flagpole. The flagpole is 30 feet tall. Find the angle of elevation to the top of the flagpole to the nearest tenth of a degree.



$$\tan^{-1} \frac{30}{100}$$
$$x = 16.7^\circ$$

Use your knowledge of the triangle families to determine the following. Express as fractions.

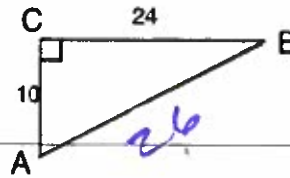
16.



Find:

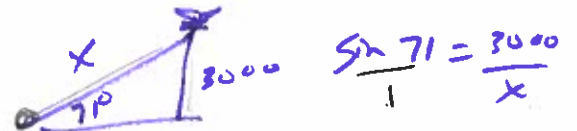
$$\begin{aligned} \sin \angle A &= \frac{24}{25} & \sin \angle B &= \frac{7}{25} \\ \cos \angle A &= \frac{7}{25} & \cos \angle B &= \frac{24}{25} \\ \tan \angle A &= \frac{24}{7} & \tan \angle B &= \frac{7}{24} \end{aligned}$$

17.



Find:

$$\begin{aligned} \sin \angle A &= \frac{24}{26} & \sin \angle B &= \frac{10}{26} \\ \cos \angle A &= \frac{10}{26} & \cos \angle B &= \frac{24}{26} \\ \tan \angle A &= \frac{24}{10} & \tan \angle B &= \frac{10}{24} \end{aligned}$$

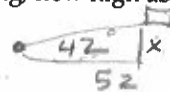


$$\sin 71 = \frac{3000}{x}$$

18. The angle of elevation to an airplane is 71° . If the airplane is flying at an altitude of 3000 meters, how far is the airplane from the observer along the line of sight?

$$3172.9 \text{ m}$$

19) A photographer points a camera at a window in a nearby building forming an angle of 42° with the camera platform. If the camera is 52 m from the building, how high above the platform is the window, to the nearest hundredth of a meter?



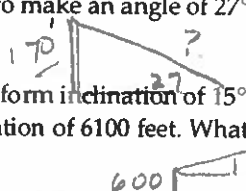
$$\tan 42 = \frac{x}{52}$$

$$46.82$$

20) John (whose line of sight is 6 ft above horizontal) is trying to estimate the height of a tall oak tree. He first measures the angle of elevation from where he is standing as 35° . He walks 30 feet closer to the tree and finds that the angle of elevation has increased by 12° . Estimate the height of the tree rounded to the nearest whole number.

~~omit~~

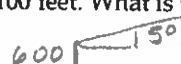
21) A radio transmission tower is 170 feet tall. How long should a guy wire be if it is to be attached 15 feet from the top and is to make an angle of 27° with the ground? Give your answer to the nearest tenth of a foot.



$$\sin 27 = \frac{15}{x}$$

$$374.5'$$

22) A straight trail with a uniform inclination of 15° leads from a lodge at an elevation of 600 feet to a mountain lake at an elevation of 6100 feet. What is the length of the trail (to the nearest foot)?



$$\sin 15 = \frac{5500}{x}$$

$$21,250'$$

23) A surveyor is measuring the distance across a small lake. He has set up his transit on one side of the lake 130 feet from a piling that is directly across from a pier on the other side of the lake. From his transit, the angle between the piling and the pier is 30° . What is the distance between the piling and the pier to the nearest foot?



$$\tan 30 = \frac{x}{130}$$

$$75'$$