

50. In the right triangle below, the measure of $\angle C$ is 90° , $AB = 5$ units, and $CB = 2$ units. What is $\tan B$?

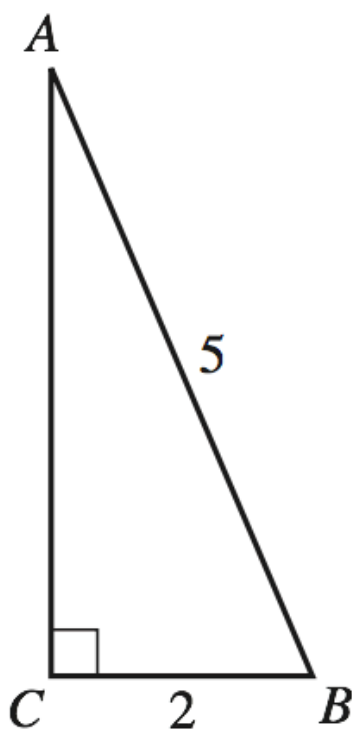
F. $\frac{\sqrt{21}}{2}$

G. $\frac{3}{2}$

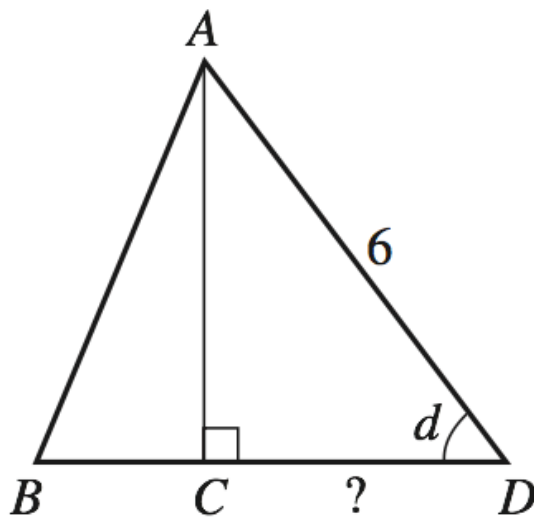
H. $\frac{\sqrt{21}}{5}$

J. $\frac{3}{5}$

K. $\frac{2}{5}$



52. In $\triangle ABD$, shown below, C is on \overline{BD} , the length of \overline{AD} is 6 inches, and $\sin d = 0.8$. How many inches long is \overline{CD} ?



- F. 1.2
- G. 1.8
- H. 3.6
- J. 4.8
- K. Cannot be determined from the given information

38. For right triangle $\triangle KLM$ below, what is $\sin \angle M$?

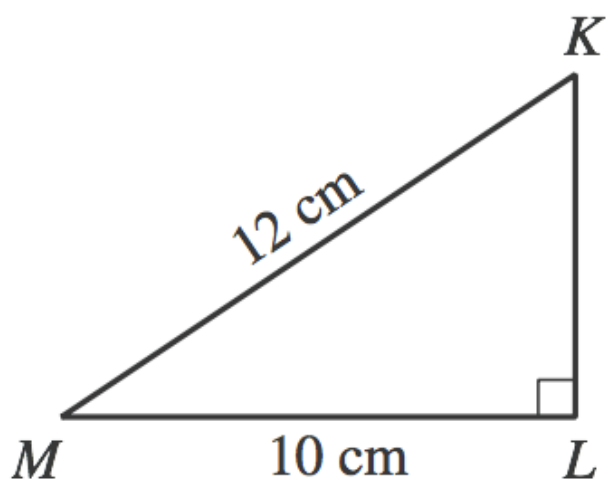
F. $\frac{10}{12}$

G. $\frac{12}{10}$

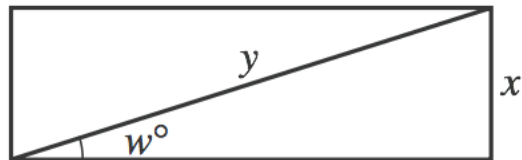
H. $\frac{\sqrt{44}}{10}$

J. $\frac{10}{\sqrt{44}}$

K. $\frac{\sqrt{44}}{12}$



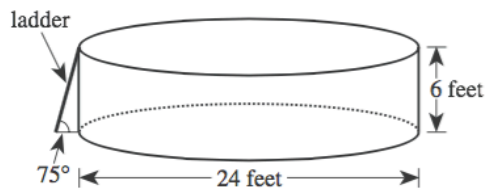
25. Which of the following trigonometric equations is valid for the side measurement x inches, diagonal measurement y inches, and angle measurement w° in the rectangle shown below?



- A. $\cos w^\circ = \frac{x}{y}$
- B. $\cot w^\circ = \frac{x}{y}$
- C. $\sec w^\circ = \frac{x}{y}$
- D. $\sin w^\circ = \frac{x}{y}$
- E. $\tan w^\circ = \frac{x}{y}$

Use the following information to answer questions 29–32.

The youth center has installed a swimming pool on level ground. The pool is a right circular cylinder with a diameter of 24 feet and a height of 6 feet. A diagram of the pool and its entry ladder is shown below.

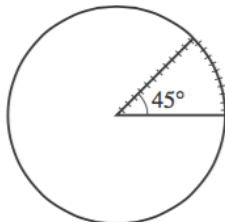


29. To the nearest cubic foot, what is the volume of water that will be in the pool when it is filled with water to a depth of 5 feet?

(Note: The volume of a cylinder is given by $\pi r^2 h$, where r is the radius and h is the height.)

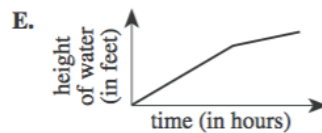
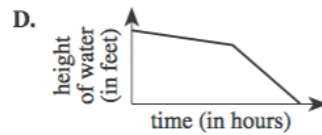
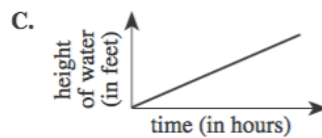
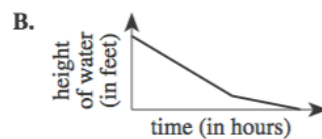
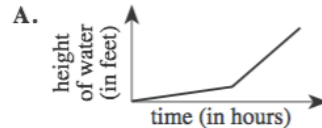
- A. 942
- B. 1,885
- C. 2,262
- D. 9,047
- E. 11,310

30. A plastic cover is made for the pool. The cover will rest on the top of the pool and will include a wedge-shaped flap that forms a 45° angle at the center of the cover, as shown in the figure below. A zipper will go along 1 side of the wedge-shaped flap and around the arc. Which of the following is closest to the length, in feet, of the zipper?



- F. 17
- G. 22
- H. 24
- J. 29
- K. 57

31. Two hoses are used to fill the pool. Twice as many gallons of water per minute flow through one of the hoses as through the other. Both hoses had been on for 12 hours and had filled the pool to the 4-foot mark when the hose with the faster flow stopped working. The hose with the slower flow then finished filling the pool to the 5-foot mark. Which of the following graphs shows the relationship between the time spent filling the pool and the height of the water in the pool?



32. The directions for assembling the pool state that the ladder should be placed at an angle of 75° relative to level ground. Which of the following expressions involving tangent gives the distance, in feet, that the bottom of the ladder should be placed away from the bottom edge of the pool in order to comply with the directions?

- F. $\frac{6}{\tan 75^\circ}$
- G. $\frac{\tan 75^\circ}{6}$
- H. $\frac{1}{6 \tan 75^\circ}$
- J. $6 \tan 75^\circ$
- K. $\tan(6 \cdot 75^\circ)$

22. The dimensions of the right triangle shown below are given in feet. What is $\sin \theta$?

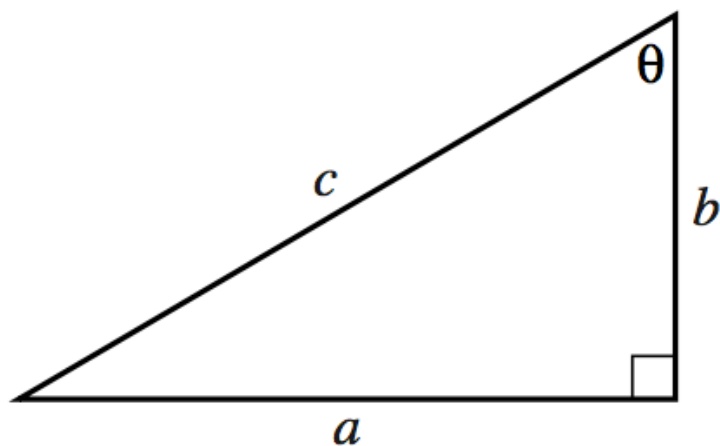
F. $\frac{a}{b}$

G. $\frac{a}{c}$

H. $\frac{b}{c}$

J. $\frac{b}{a}$

K. $\frac{c}{a}$



42. According to the measurements given in the figure below, which of the following expressions gives the distance, in miles, from the boat to the dock?

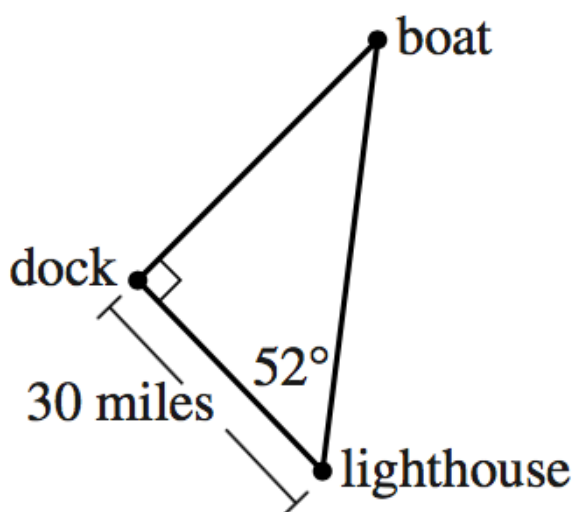
F. $30 \tan 52^\circ$

G. $30 \cos 52^\circ$

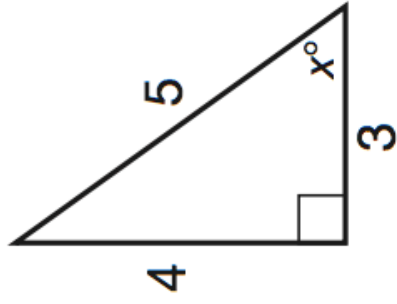
H. $30 \sin 52^\circ$

J. $\frac{30}{\cos 52^\circ}$

K. $\frac{30}{\sin 52^\circ}$



42. Find $\tan x$ for the right triangle below.



f. $\frac{5}{4}$

g. $\frac{3}{4}$

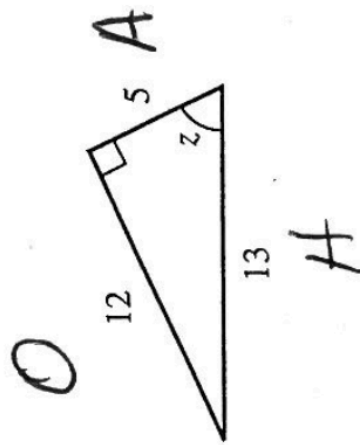
h. $\frac{4}{3}$

i. $\frac{6}{3}$

j. $\frac{5}{3}$

43. For the triangle shown below, what is the value of $\tan z$?

- A. $\frac{5}{12}$
- B. $\frac{12}{5}$
- C. $\frac{5}{13}$
- D. $\frac{13}{5}$
- E. $\frac{12}{13}$



EASY Trig

$$\tan = \frac{\text{opposite}}{\text{adjacent}}$$

$$\tan z = \frac{12}{5}$$

58. The radio station WEST is erecting a new transmitting tower that is 280 feet tall. A support wire will be attached to the ground at point A and to the tower 250 feet up at point B , as shown below. The wire must be at least as long as \overline{AB} . Which of the following expresses the length of \overline{AB} , in feet?

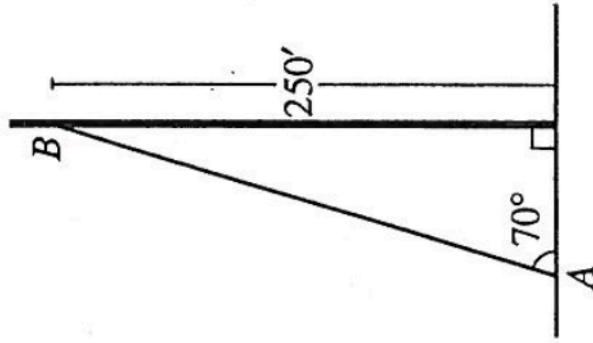
F. $250 \cos 70^\circ$

G. $250 \sin 70^\circ$

H. $250 \tan 70^\circ$

J. $\frac{250}{\cos 70^\circ}$

K. $\frac{250}{\sin 70^\circ}$



DO YOUR FIGURING HERE.

TRIG

$$\sin 70^\circ = \frac{250}{AB}$$

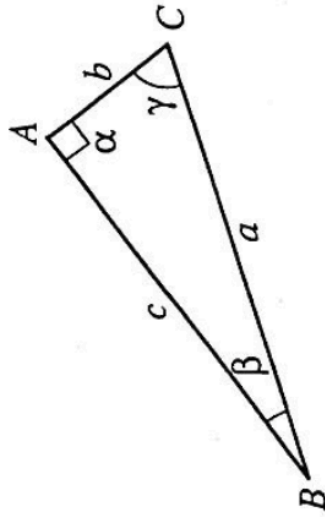
Solve for AB

$$AB \sin 70^\circ = \frac{250}{AB}$$

$$AB = \frac{250}{\sin 70^\circ}$$



60. Right triangle $\triangle ABC$ has angle measures α , β , and γ degrees and side lengths a , b , and c inches, as illustrated below. Which of the following is true about the value of the product $\tan \beta \tan \gamma$?



- F. The value is 1.
 G. The value is $\frac{b^2}{c^2}$.
 H. The value is $\frac{b^2 c^2}{a^4}$.
 J. The value is undefined.
 K. The value cannot be determined from the given information.

Trig

$$\tan \beta = \frac{b}{c}$$

$$\tan \gamma = \frac{c}{b}$$

$$\frac{b}{c} \cdot \frac{c}{b} = 1$$

END OF TEST 2

STOP! DO NOT TURN THE PAGE UNTIL TOLD TO DO SO.

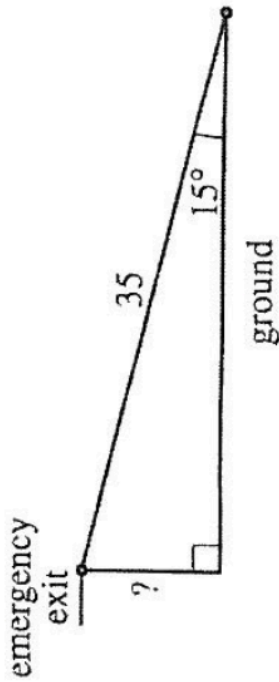
DO NOT RETURN TO THE PREVIOUS TEST.

$$\frac{bc}{cb} = \frac{bc}{bc} = 1$$

Common
Difference

2 2

42. As shown in the figure below, an escape ramp leading from an emergency exit of an airplane is 35 feet long when fully extended and forms a 15° angle with the level ground.



Given the trigonometric approximations in the table below, what is the height above the ground of the emergency exit, rounded to the nearest 0.1 foot?

cos 15°	0.966
sin 15°	0.259
tan 15°	0.268

- F. 2.8
- G. 7.4
- H. 7.7
- J. 9.1
- K. 9.4

DO YOUR FIGURING HERE.

EASY TRIG

SOH CAH TOA

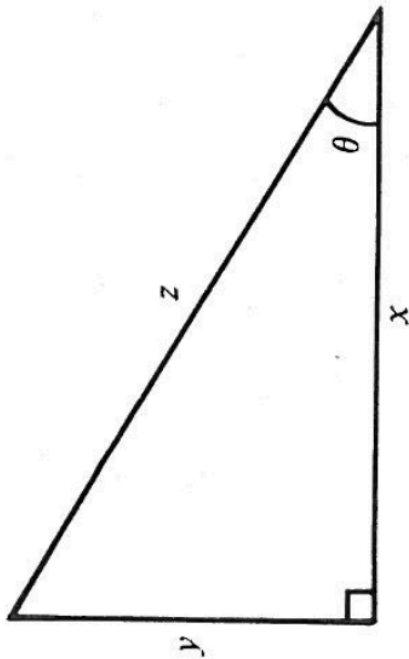
$$\sin 15^\circ = \frac{?}{35}$$

$$0.259 = \frac{?}{35}$$

$$9.065 = (0.259) 35 = ? \approx 9.1$$

→ A — To the Nearest 0.1 foot

37. For the right triangle below, which of the following expressions is equal to $\cos \theta$?



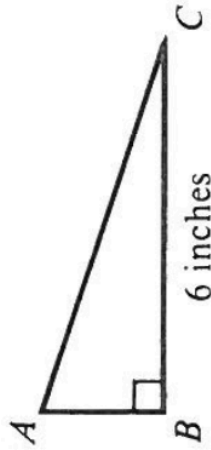
- A. $\frac{x}{y}$
B. $\frac{x}{z}$
C. $\frac{y}{x}$
D. $\frac{y}{z}$
E. $\frac{z}{x}$

SOHCAHTOA

$\cos = \frac{\text{Adjacent}}{\text{Hypotenuse}}$

$$\cos \theta = \frac{x}{z}$$

44. In the right triangle below, if $\angle C$ has a sine of $\frac{2}{\sqrt{29}}$, a cosine of $\frac{5}{\sqrt{29}}$, and a tangent of $\frac{2}{5}$, how many inches long is \overline{AB} ?



F. $\frac{2}{5}$

G. $\frac{12}{5}$

H. $\frac{12}{\sqrt{29}}$

J. $\frac{30}{\sqrt{29}}$

K. 6

The tangent would
 product a nice proportion
 to solve for \overline{AB}

$$\frac{\overline{AB}}{6} = \frac{2}{5} \quad 5(\overline{AB}) = 12$$

$$\overline{AB} = \frac{12}{5}$$

32. An angle in a right triangle has measure α . If $\sin \alpha = \frac{24}{25}$ and $\tan \alpha = \frac{24}{7}$, then $\cos \alpha = ?$

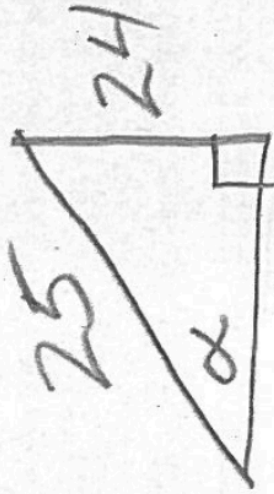
F. $\frac{7}{25}$

G. $\frac{7}{24}$

H. $\frac{7}{\sqrt{527}}$

J. $\frac{7}{\sqrt{1,201}}$

K. $\frac{25}{7}$



7
Fill in given
Info Provided

SOH CAH TOA

$$\cos \alpha = \frac{A}{H} = \frac{7}{25}$$

38. What is the sine of α in the right triangle shown in the standard (x,y) coordinate plane below?

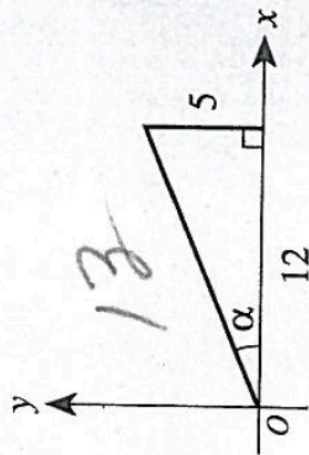
→ F. $\frac{5}{13}$

G. $\frac{5}{12}$

H. $\frac{12}{13}$

J. $\frac{12}{5}$

K. $\frac{13}{5}$



SOHCAHTOA and
Pythagorean Triples

5, 12, 13 Triple

$$\sin \theta = \frac{O}{H} = \frac{5}{13}$$

F

is received by both Ranger Station A and Ranger Station B. As shown below, Ranger Station A is 6 miles directly west of Ranger Station B. Ranger Station A is directly south of Site C. The entire region is flat and level. On a map, the angle formed at Ranger Station B by drawing straight lines from Ranger Station B to Site C and to Ranger Station A measures 57° . About how many miles away from Site C is the closer of the 2 ranger stations?

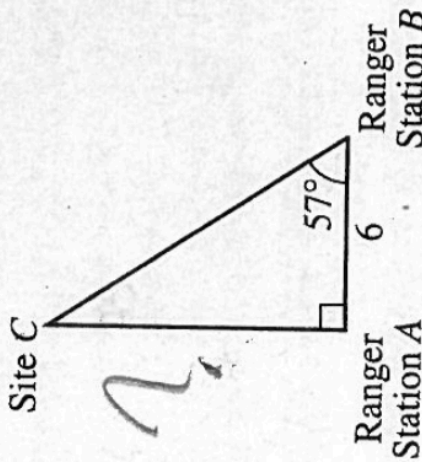
F. $\frac{6}{\sin 57^\circ}$

G. $\frac{6}{\cos 57^\circ}$

H. $6 \sin 57^\circ$

J. $6 \cos 57^\circ$

K. $6 \tan 57^\circ$



*Trigonometry
The closer of the two
from Site C is*

*Station A
 $\tan 57^\circ = \frac{?}{6}$
 $6 \tan 57^\circ = ?$*

K

30. The radius of the base of the right circular cone shown below is 5 inches, and the height of the cone is 7 inches. Solving which of the following equations gives the measure, θ , of the angle formed by a slant height of the cone and a radius?

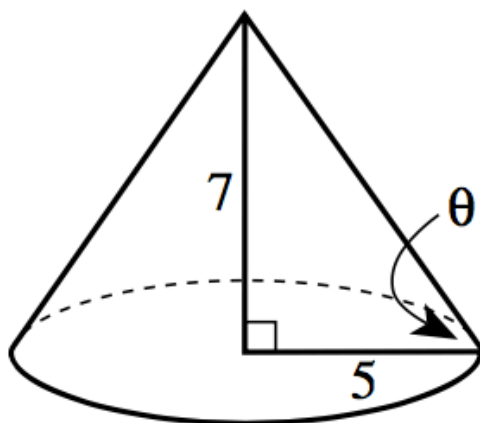
F. $\tan \theta = \frac{5}{7}$

G. $\tan \theta = \frac{7}{5}$

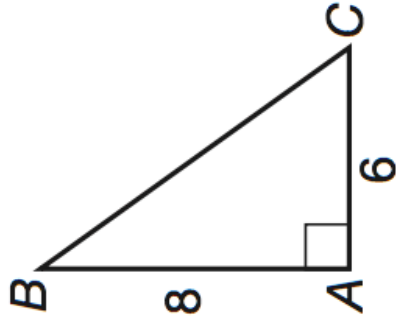
H. $\sin \theta = \frac{5}{7}$

J. $\sin \theta = \frac{7}{5}$

K. $\cos \theta = \frac{7}{5}$



41. What is the sine of angle B in the triangle below?



- a. $\frac{3}{4}$
- b. $\frac{3}{5}$
- c. $\frac{4}{3}$
- d. $\frac{4}{5}$
- e. $\frac{5}{4}$

53. In the right triangle below, $0 < b < a$. One of the angle measures in the triangle is $\tan^{-1}\left(\frac{a}{b}\right)$. What is $\cos\left[\tan^{-1}\left(\frac{a}{b}\right)\right]$?

A. $\frac{a}{b}$

B. $\frac{b}{a}$

C. $\frac{a}{\sqrt{a^2 + b^2}}$

D. $\frac{b}{\sqrt{a^2 + b^2}}$

E. $\frac{\sqrt{a^2 + b^2}}{a}$

