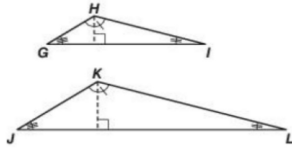


### STATION 1

Triangle GHI is similar to triangle JKL. Altitudes are drawn from vertices H and K. Which equation correctly describes the relationship between angles I and L? Justify your answer.

- A.  $\sin I = \cos L$
- B.  $\sin I = \sin L$
- C.  $\cos I = \tan L$
- D.  $\cos I = \sin L$



### STATION 2

Which function has the same value as the expression  $\cos 26^\circ$ ?

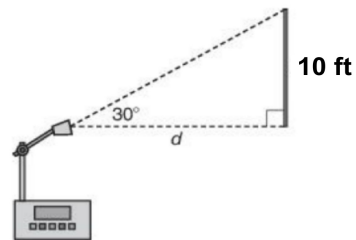
- A.  $\sin 64^\circ$ , because the angle measures are complementary
- B.  $\cos 64^\circ$ , because the angle measures are complementary
- C.  $\cos 154^\circ$ , because the angle measures are supplementary
- D.  $\sin 154^\circ$ , because the angle measures are supplementary

### STATION 3

Given  $\triangle HIJ \sim \triangle KLM$  and  $\sin(\angle J) = 4/9$ , find  $\sin(\angle M)$

### STATION 4

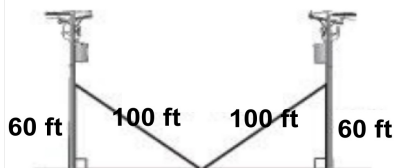
Mr. Montoya positioned an overhead projector in his classroom, as shown below.



What is the distance,  $d$ , the projector must be from the screen for a projected image to fill the screen exactly, top to bottom?

### STATION 5

Two telephone poles are supported by 100-foot cables as shown below. The cables are attached at a height of 50 feet.



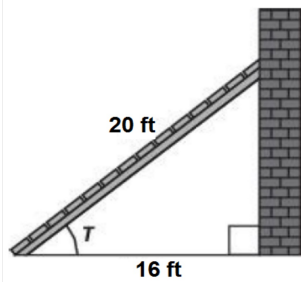
How far apart are the telephone poles?

### STATION 6

Joe walked 35 feet up a ramp on the gym floor. The ramp had a slope of  $22^\circ$  from the gym floor. To the nearest foot, how far was he from the gym floor?

### STATION 7

The top of a 20-foot ramp is placed 18 feet above the base of a building. The bottom of the ramp is 24 feet from the building.



What is the ratio that represents the sine of Angle T?

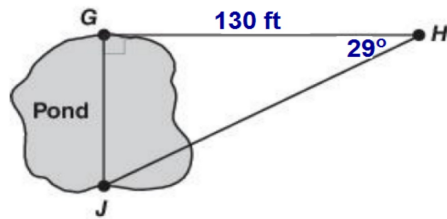
### STATION 8

Which of the following is equal to  $\sin 55^\circ$ ?

- A.  $\cos 55^\circ$
- B.  $\sin 55^\circ$
- C.  $\cos 125^\circ$
- D.  $\cos 35^\circ$

### STATION 9

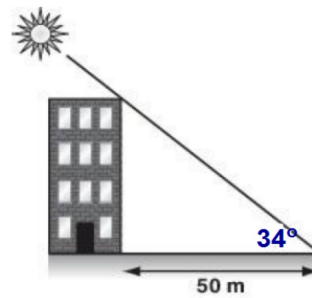
To measure the distance across a pond, a surveyor measured the distance from  $G$  to  $H$  as 130 feet.



If the measure of  $\angle GHJ$  is  $29^\circ$ , what is the approximate distance from  $G$  to  $J$  across the pond?

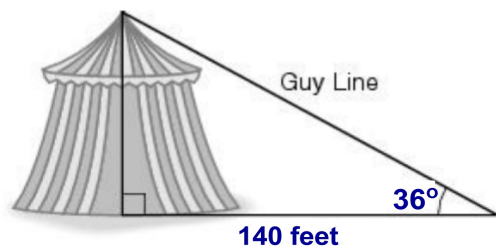
### STATION 10

If the shadow of this building is 50 meters long when the angle of elevation to the sun is  $34^\circ$ , what is the approximate height, in meters, of the building?



### STATION 11

A circus tent is supported by wires called "guy lines," as shown below.



How tall is the center pole of the circus tent?

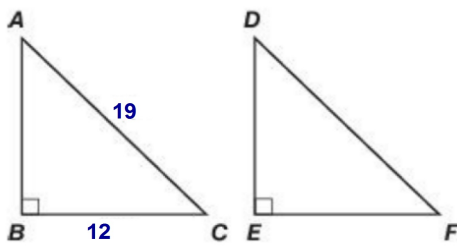
### STATION 12

$\angle D$  and  $\angle E$  are complementary angles. If  $\sin \angle D = \frac{p}{q}$ , find  $\cos \angle E$ .

- A.  $\frac{q}{p}$
- B.  $\frac{p}{q}$
- C.  $90^\circ - \frac{p}{q}$
- D. not enough information is given

### STATION 13

The diagram below shows two right triangles with the side measurements indicated. If  $\triangle ABC \sim \triangle DEF$ , find  $\tan(\angle F)$ .



### STATION 14

A pilot sights a beacon at an  $19.5^\circ$  angle of depression. The pilot is flying at an altitude of **7000 ft** feet.

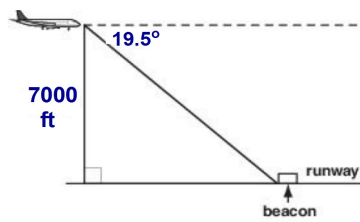
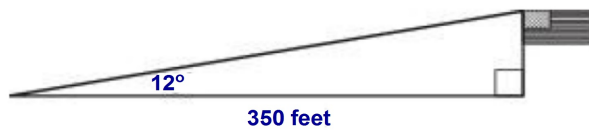


Figure not drawn to scale

Approximately how many feet will the plane have to fly to be on the ground next to the beacon?

### STATION 15

What is the height of the flagpole?

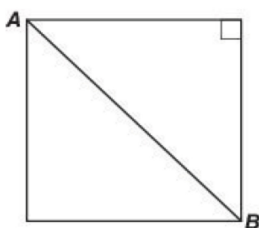


### STATION 16

What is the exact length of the diagonal of a square with a side length of 8?

### STATION 17

The perimeter of the square park shown below is **2800** feet.



What is the length of the diagonal path from A to B across the park?

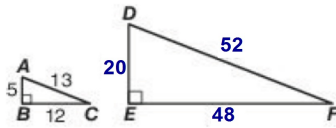
### STATION 18

In  $\triangle ABC$ ,  $m\angle B = 90^\circ$ . For what value of  $x$  does  $\sin(x - A) = \cos A$ ?

- A.  $0^\circ$
- B.  $45^\circ$
- C.  $90^\circ$
- D.  $180^\circ$

### STATION 19

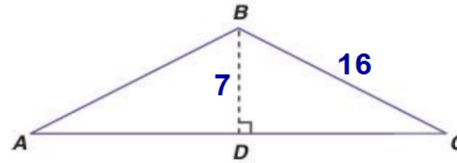
Right triangle  $ABC$  has sides of length 5, 12, and 13. Right triangle  $DEF$  is similar to  $ABC$ , but each side is three times longer than the corresponding side of  $ABC$ .



Which fractions represent the cosine of  $\angle A$  and the cosine of  $\angle D$ ?

### STATION 20

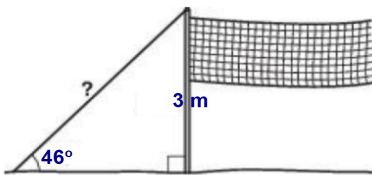
Given:  $\triangle ABC$  is isosceles;  $\angle BDC$  is a right angle



Which is the length of  $\overline{AC}$ ?

### STATION 21

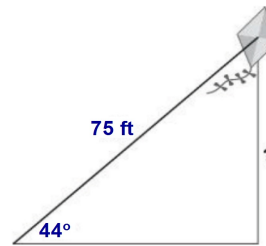
Vivian is using a rope to stabilize a pole that is 3 meters high.



If the rope forms a  $46^\circ$  angle with the ground, what is the length, to the nearest tenth of a meter, of the rope?

### STATION 22

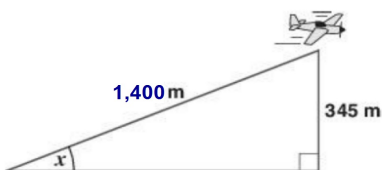
Tom is flying his kite. The kite's angle of elevation is  $44^\circ$



To the nearest foot, how high off the ground is the kite when it is 75ft away from Tom?

### STATION 23

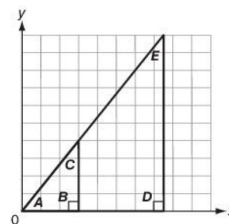
A plane takes off from a runway and climbs, keeping a constant angle with the ground as shown.



At a certain point in time, the plane will have traveled 1,400 meters and will be at an altitude of 345 meters. At this point, what is the angle, to the nearest tenth, at which the plane has risen?

### STATION 24

Right triangles  $ABC$  and  $ADE$  are drawn on the coordinate grid below.



What is the relationship between  $\tan C$  and  $\tan E$ ?

## STATION 25

What is the measure of  $\angle x$ , to the nearest tenth of a degree?

