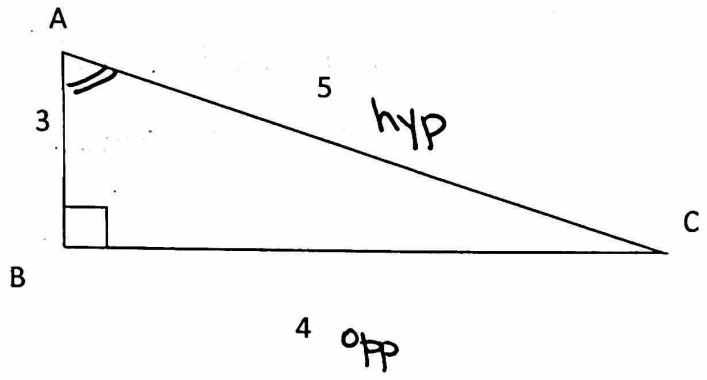
Name: KEY

Right Triangle Test

1. Write the sine ratio of ∠A.



a. Sin A=4/3
b. Sin A=3/5
c. Sin A=4/5
d. Sin A=3/4

2. In the ratio tan 26 = a/6. The *a* represents what part of the triangle?
   a. leg b. hypotenuse c. opposite d. adjacent

$\tan\theta = \frac{opp}{adj}$

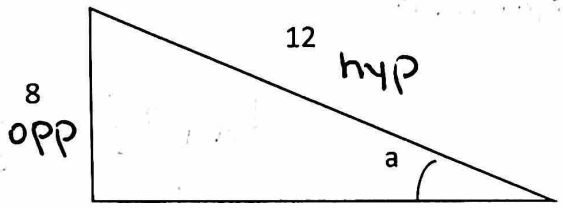
3. If Tan A = 0.268, then m∠A = ____?
   a. 15 b. 0.02 c. 74.5 d. 1

$\tan^{-1}(.268)$

4. Solve for d. $\frac{\sin 52}{1} = \frac{d}{32}$
   a. 1664 b. 19.7 c. 25.2 d. 41

$d = 32 \sin(52)$

5. Solve for the variable. Round to the nearest whole number.

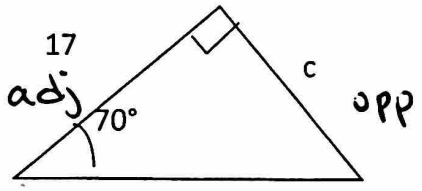


$\sin a = \frac{8}{12}$

$a = \sin^{-1}\left(\frac{8}{12}\right) \approx 41.8°$

   a. 48° b. 34° c. 42° d. 30°

6. Calculate the length of side c.



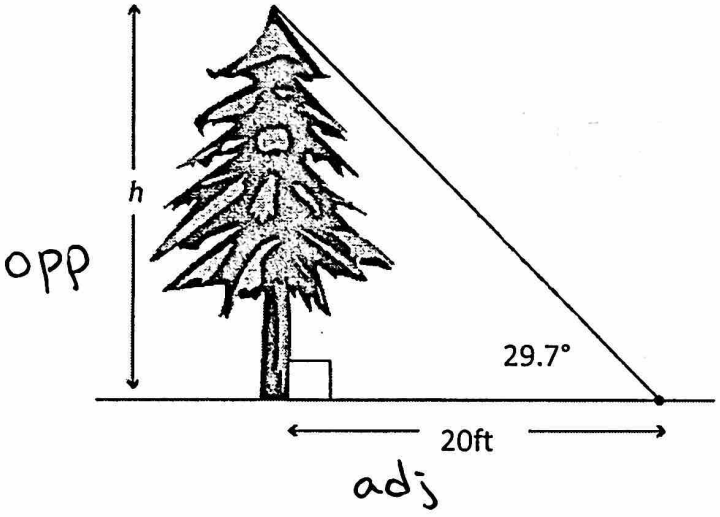
$\frac{\tan 70^\circ}{1} = \frac{c}{17}$

$c = 17 \tan 70^\circ$

$c \approx 46.7$

a. 47 b. 16 c. 6 d. 24

7. Find the height of the tree to the nearest foot.



a. 136.1 ft

b. 11 ft

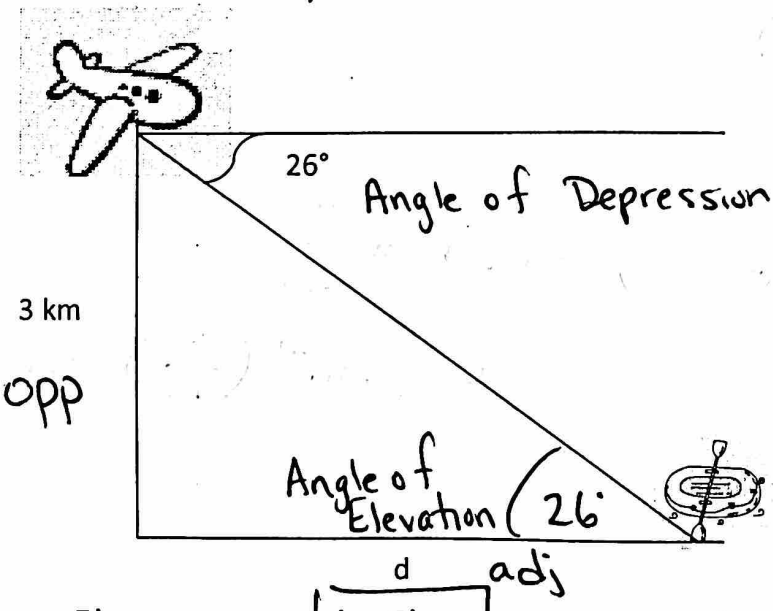
c. 14.7 ft

d. 594 ft

$\frac{\tan 29.7^\circ}{1} = \frac{h}{20}$

$h = 20 \tan 29.7 \approx 11.4$

8. An airplane pilot sights a life raft at a 26° angle of depression. The airplane's altitude is 3 km. What is the airplane's surface distance *d* from the raft? Round your answer to the nearest whole number.



$\frac{\tan 26^\circ}{1} = \frac{3}{d}$

$\frac{d \cdot \tan 26^\circ}{\tan 26^\circ} = \frac{3}{\tan 26^\circ}$

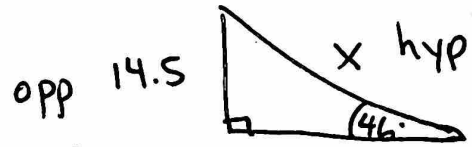
$d \approx 6.15$

a. 5km b. 6km c. 4km d. 3km

9.

A cat is on top of a tree that is 14.5 feet tall. How long must the ladder be to reach the cat if it makes a 46° angle with the ground?

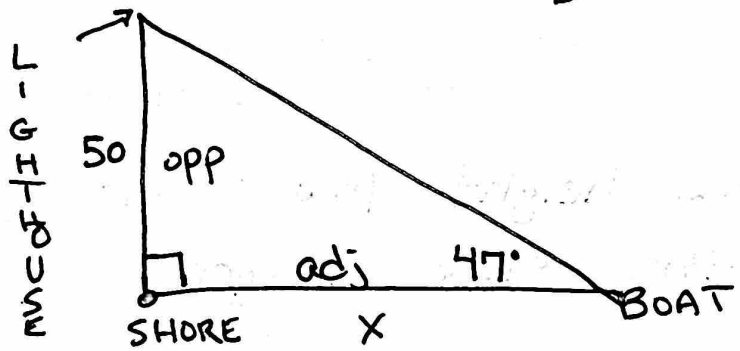
A 10.07 feet B 10.43 feet **C 20.16 feet** D 20.87 feet



$\frac{\sin 46}{1} = \frac{14.5}{x}$ $x \sin 46 = 14.5$ $x = \frac{14.5}{\sin 46}$ $x \approx 20.157$

10. A captain of a ship spots the top of a lighthouse at a 47° angle of elevation. He knows that the lighthouse is 50 ft above the shoreline. How far is the ship from the shore?

a) Draw and label a picture to represent the lighthouse, shore, and angle of elevation.

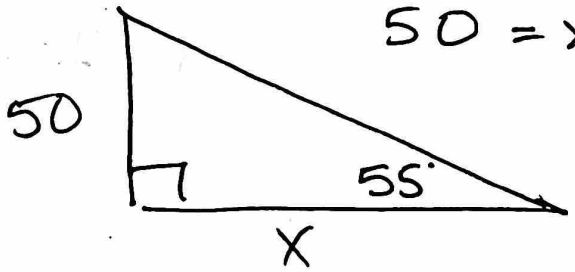


b) Calculate the distance of the ship from the shore.

$\frac{\tan 47}{1} = \frac{50}{x}$

$\frac{50}{\tan 47} = \frac{x \tan 47}{\tan 47}$ $x \approx 46.6$ ft

c) How far would the ship be from the shore if the angle of elevation was 55°?

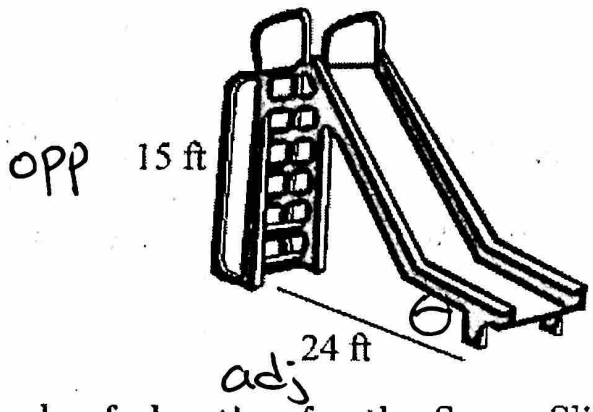


$50 = x \tan 55$

$x = \frac{50}{\tan 55} \approx$ 35.01 ft

11.

A new Super Slide has a rise of 15 feet and a run of 24 feet as shown in the figure below. (3 points)



- Calculate the angle of elevation for the Super Slide. Use mathematics to explain how you determined your answer. Use words, symbols, or both in y our explanation.

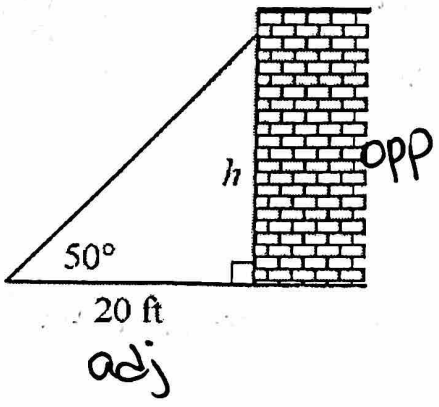
$\tan\theta = \frac{15}{24}$ $\theta = \tan^{-1}\left(\frac{15}{24}\right) \approx \boxed{32^\circ}$

- The safety code for any playground slide requires a maximum angle of elevation to be 30°. How could the designer change the dimensions of the new slide to meet the safety code? Use mathematics to justify your answer.

Make the height lower or make the slide longer

12.

Tyeisha is standing 20 feet from the base of her new apartment building. The balcony of her apartment is at an angle of 50° from where she is standing. How many feet off the ground is Tyeisha's balcony?

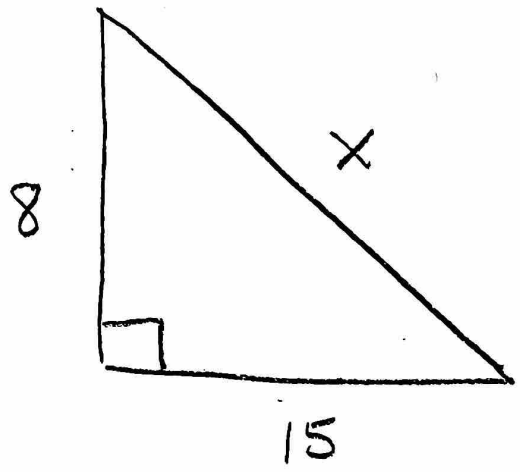


$\frac{\tan 50^\circ}{1} = \frac{h}{20}$

$h = 20 \tan 50^\circ$

$\boxed{h \approx 23.8 \text{ ft}}$

(13) Find X:



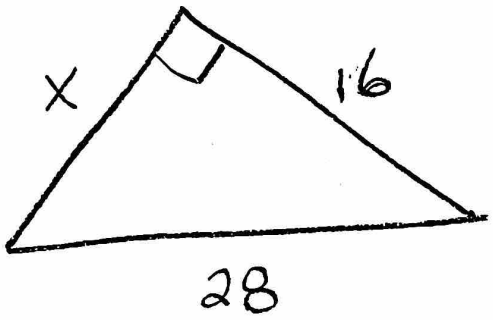
$8^2 + 15^2 = x^2$

$64 + 225 = x^2$

$289 = x^2$

$\boxed{17 = x}$

(14) Find X:



$x^2 + 16^2 = 28^2$

$x^2 + 256 = 784$

$x^2 = 528$

$\boxed{x \approx 22.98}$

(15) What type of triangle is one with sides 8, 12, 16 ?

$8^2 + 12^2 \stackrel{?}{=} 16^2$

$64 + 144$

$208 < 256$

Obtuse