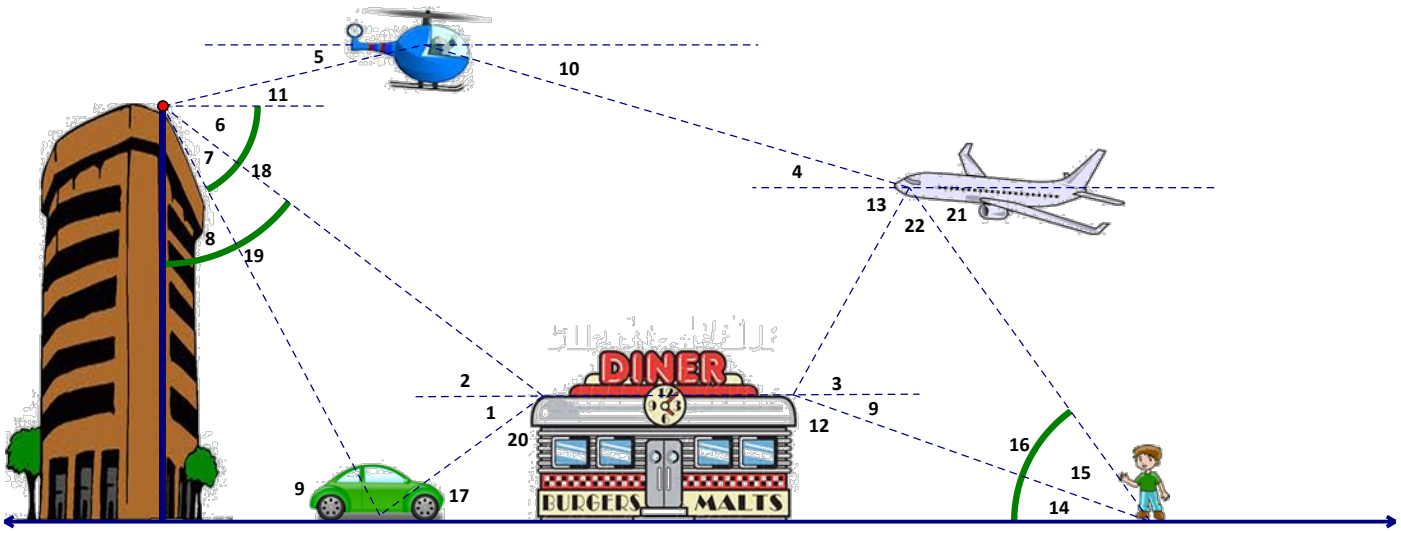
1. Choose the correct angle number for the provided description.



a) the angle of elevation from the **CAR** to the top of the **DINER** is ∠17.

b) the angle of depression from the top of the **TALL BUILDING** to the **DINER** is ∠6.

c) the angle of elevation from the **PLANE** to the **HELICOPTER** is ∠4.

d) the angle of depression from the top of the **DINER** to the **BOY** is ∠9.

e) the angle of depression from the **HELICOPTER** to the **PLANE** is ∠10.

f) the angle of depression from the **PLANE** to the top of the **DINER** is ∠13.

g) the angle of elevation from the **BOY** to the top of the **DINER** is ∠14.

h) the angle of depression from the top of the **TALL BUILDING** to the top of the **CAR** is ∠18.

i) the angle of depression from the **HELICOPTER** to the top of the **TALL BUILDING** is ∠5.

j) the angle of elevation from the top of the **DINER** to the top of the **TALL BUILDING** is ∠2.

k) the angle of elevation from the top of the **DINER** to the **PLANE** is ∠3.

l) the angle of depression from the top of the **DINER** to the **CAR** is ∠1.

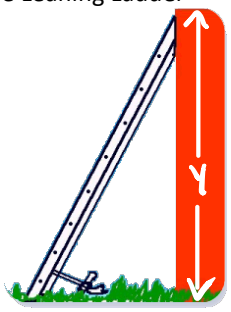
m) the angle of elevation from the **BOY** to the front of the **PLANE** is ∠16.

n) the angle of depression from the front of the **PLANE** to the **BOY** is ∠21.

o) the angle of elevation from the **TALL BUILDING** to the **HELICOPTER** is ∠11.

2. Label (or Draw and label) the side or angle that is represented by the description.

a) The Leaning Ladder

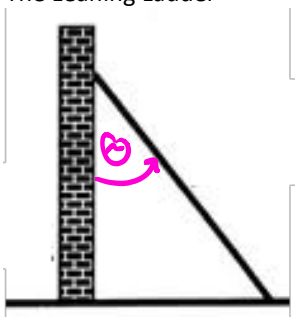


Height on the wall that the ladder reaches.

b) The Leaning Ladder

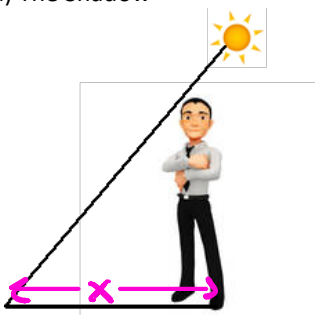
The distance from the foot of the ladder to the wall.

c) The Leaning Ladder



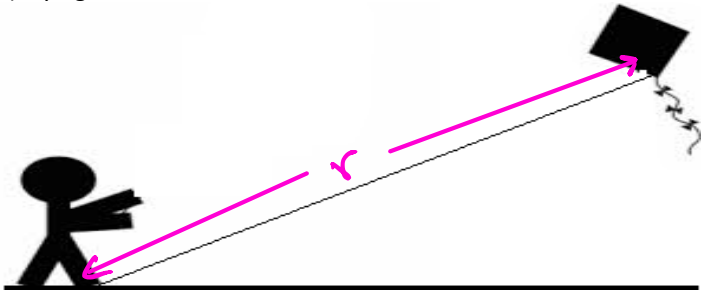
The angle the ladder forms with the wall.

d) The Shadow



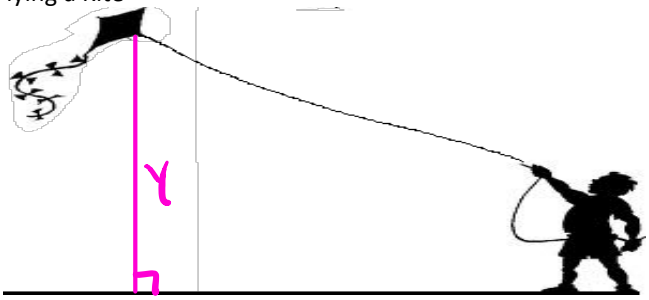
The length of his shadow.

e) Flying a Kite



The length of the string.

f) Flying a Kite



The height of the kite.

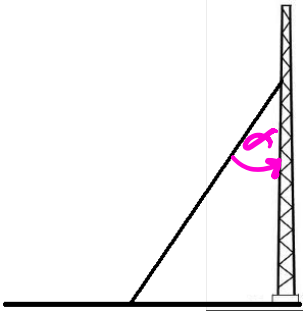
What are some of the assumptions that are made about the kite example so that it works easily as a trigonometry question?

The string is always tight, the picture is not to scale and the black dude has hands for feet.

g) The Support Guy Wire

The distance from the base of the tree to where the guy wire is fastened to the ground.

h) The Support Guy Wire

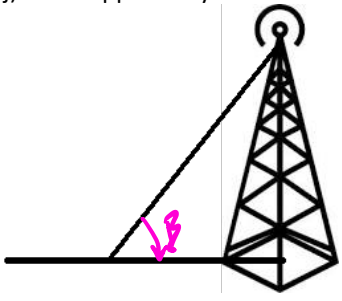


The angle between the antenna and the guy wire.

i) The Support Guy Wire

The height of where the guy wire is fastened to the antenna.

j) The Support Guy Wire



The angle formed between the wire and the ground.

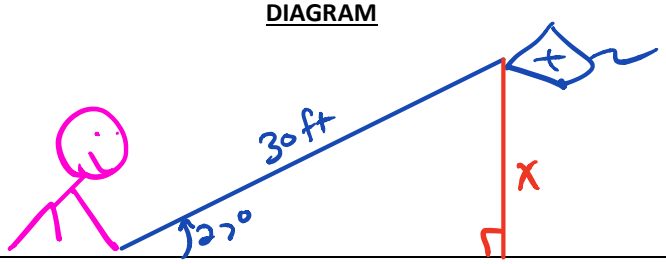
What are some of the assumptions that are made about the guy wire example so that it works easily as a trigonometry question?

The wire is always tight, the picture is not to scale and the tree or antenna is vertical

3. Create the diagram for the following descriptions. Label the diagram completely including putting the x for the unknown missing value.

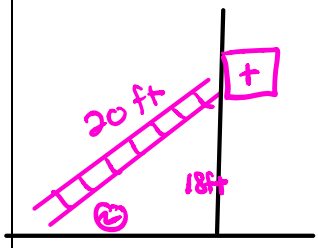
a) A young boy lets out 30 ft of string on his kite. If the angle of elevation from the boy to his kite is 27°, how high is the kite?

DIAGRAM



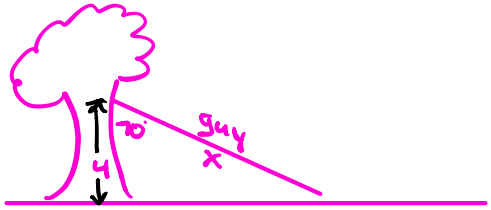
b) A 20 ft ladder leans against a wall so that it can reach a window 18 ft off the ground. What is the angle formed at the foot of the ladder?

DIAGRAM



c) To support a young tree, Jack attaches a guy wire from the ground to the tree. The wire is attached to the tree 4 ft above the ground. If the angle formed between the wire and the tree is 70°, what is the length of the wire?

DIAGRAM

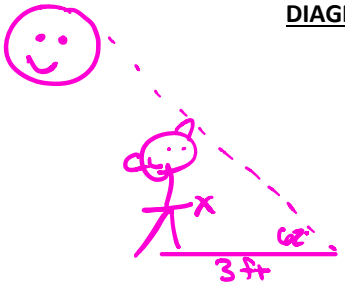


d) A helicopter is directly over a landing pad. If Billy is 110 ft from the landing pad, and looks up to see the helicopter at 65° to see it. How high is the helicopter?

DIAGRAM

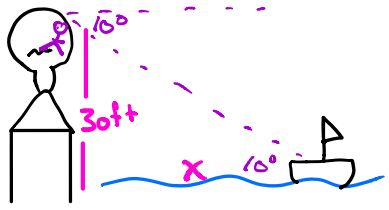
e) A man casts a 3 ft long shadow. If the sun's rays strike the ground 62°, what is the height of the man?

DIAGRAM



f) A man in a lighthouse tower that is 30 ft. He spots a ship at sea at an angle of depression of 10°. How far is the ship from the base of the lighthouse?

DIAGRAM



4. Now solve them.

a) $\sin(27°) = \frac{x}{30}$

$30\sin(27°) = x$

$x \approx 13.6$ ft

b) $\sin x = \frac{18}{20}$

$x = \sin^{-1}\left(\frac{18}{20}\right)$

$\theta \approx 64.2°$

c) $\cos(70°) = \frac{4}{x}$

$x\cos(70°) = 4$

$x = \frac{4}{\cos(70°)}$

$x \approx 11.7$ ft

d) $\tan(65°) = \frac{x}{110}$

$110\tan(65°) = x$

$x \approx 235.9$ ft

e) $\tan(62°) = \frac{x}{3}$

$3\tan(62°) = x$

$x \approx 5.6$ ft

f) $\tan(10°) = \frac{30}{x}$

$x\tan(10°) = 30$

$x = \frac{30}{\tan(10°)}$

$x \approx 170.1$ ft