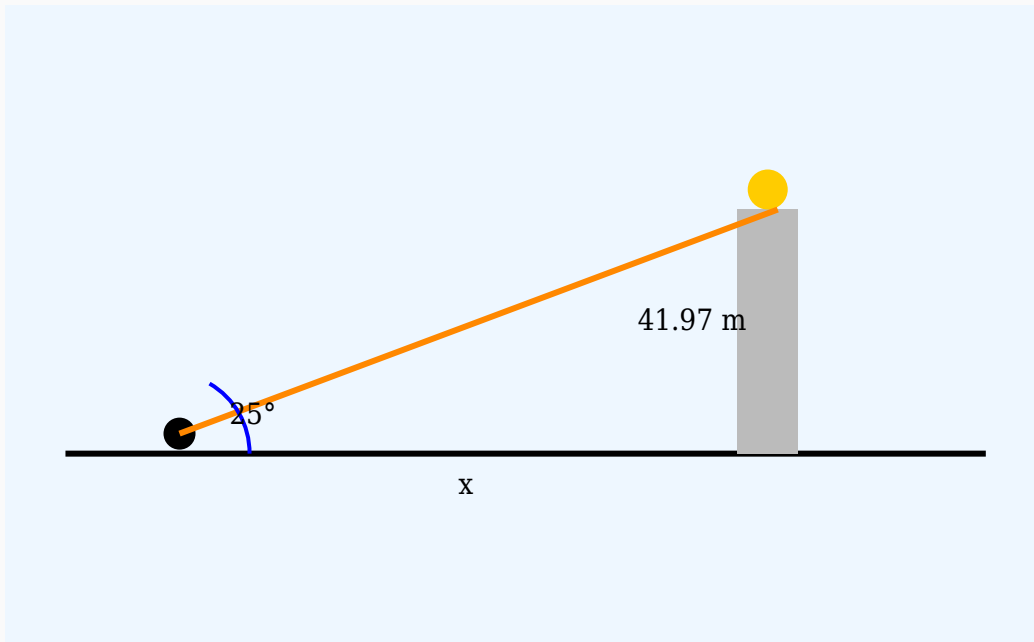


Angle of Elevation Solved Worksheet

Question 1

A surveyor notices the top of a electric pole at an angle of elevation of 25° . Determine the horizontal distance if the height of the electric pole is 41.97 m.



Solution:

Using:

$$\tan \theta = \text{Opposite} / \text{Adjacent}$$

$$\tan 25^\circ = 41.97 / \text{Distance}$$

$$0.47 = 41.97 / \text{Distance}$$

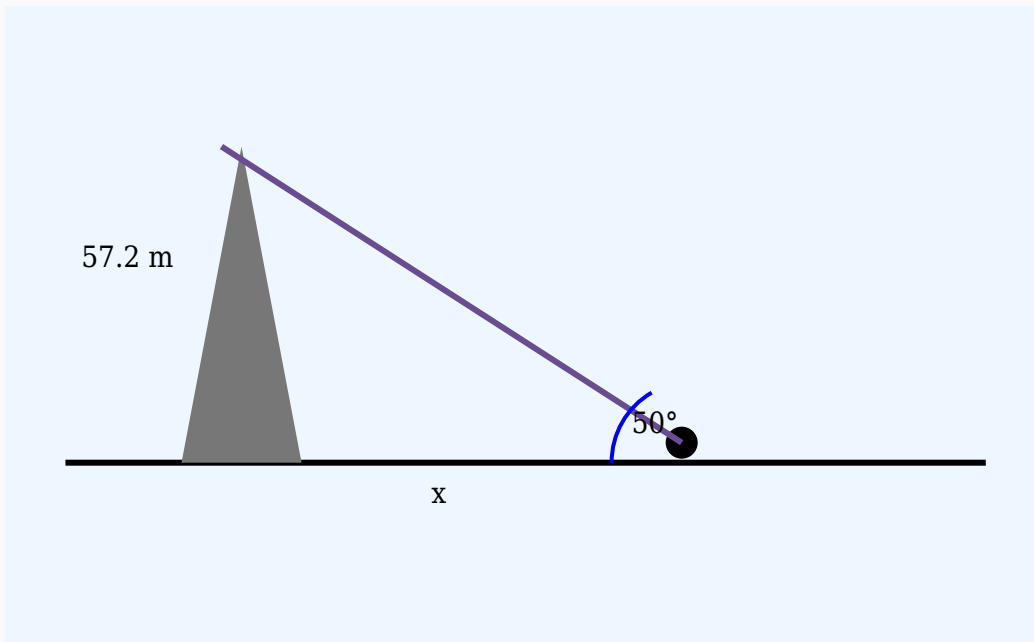
$$\text{Distance} = 41.97 / 0.47$$

$$\text{Distance} = 89.3 \text{ m}$$

Answer: 89.3 m

Question 2

The angle of elevation to the top of a bridge is 50° . Find the distance from the observer to the base if the height is 57.2 m.



Solution:

Using:

$$\tan \theta = \text{Opposite} / \text{Adjacent}$$

$$\tan 50^\circ = 57.2 / \text{Distance}$$

$$1.19 = 57.2 / \text{Distance}$$

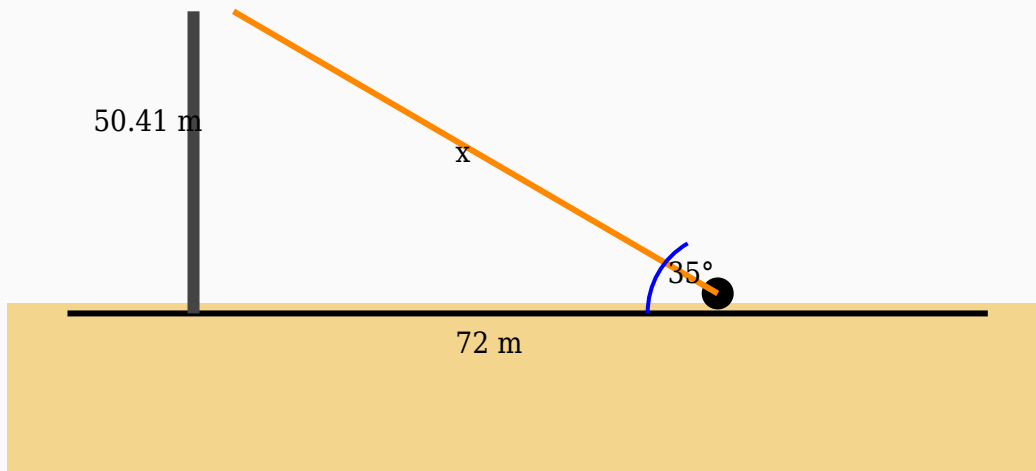
$$\text{Distance} = 57.2 / 1.19$$

$$\text{Distance} = 48.07 \text{ m}$$

Answer: 48.07 m

Question 3

An observer looks at the top of a flagpole making an angle of elevation of 35° . Determine the length of the line of sight if the horizontal distance is 72 m.



Solution:

Using:

$\cos \theta = \text{Adjacent} / \text{Hypotenuse}$

$\cos 35^\circ = 72 / \text{Hypotenuse}$

$0.82 = 72 / \text{Hypotenuse}$

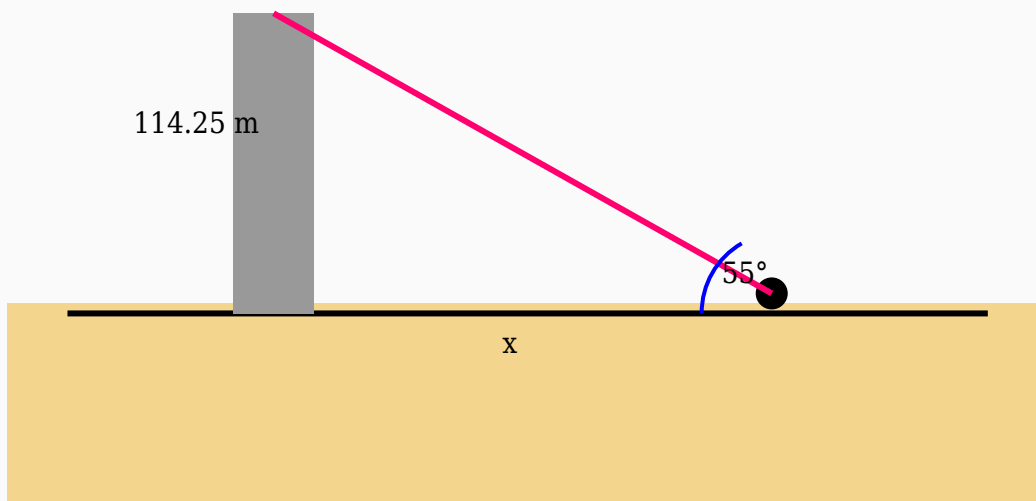
$\text{Hypotenuse} = 72 / 0.82$

$\text{Hypotenuse} = 87.8 \text{ m}$

Answer: 87.8 m

Question 4

A photographer observes the top of a water tank at an angle of elevation of 55° . If the height of the water tank is 114.25 m, find the horizontal distance.



Solution:

Using:

$\tan \theta = \text{Opposite} / \text{Adjacent}$

$\tan 55^\circ = 114.25 / \text{Distance}$

$1.43 = 114.25 / \text{Distance}$

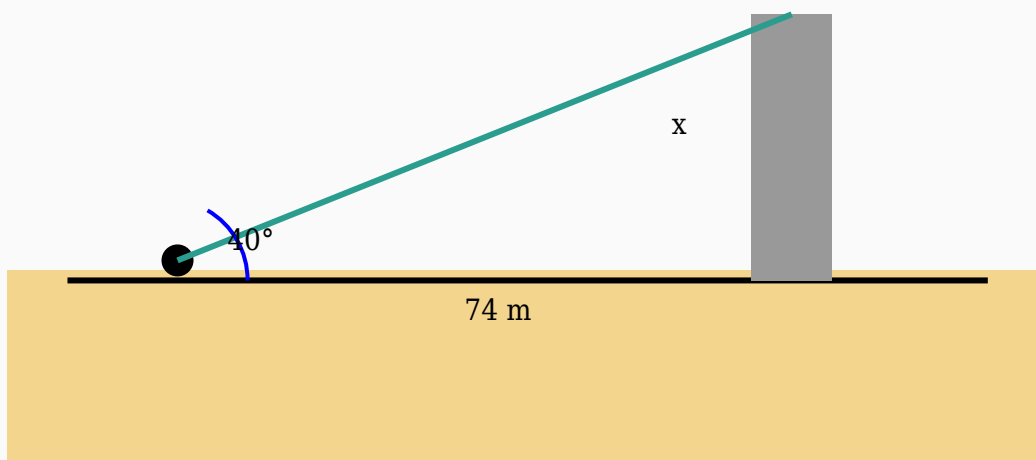
$\text{Distance} = 114.25 / 1.43$

$\text{Distance} = 79.9 \text{ m}$

Answer: 79.9 m

Question 5

A surveyor looks at the top of a electric pole at an angle of elevation of 40° . Find the height of the electric pole if the distance from the base is 74 m.



Solution:

Using:

$\tan \theta = \text{Opposite} / \text{Adjacent}$

$\tan 40^\circ = \text{Height} / 74$

$0.84 = \text{Height} / 74$

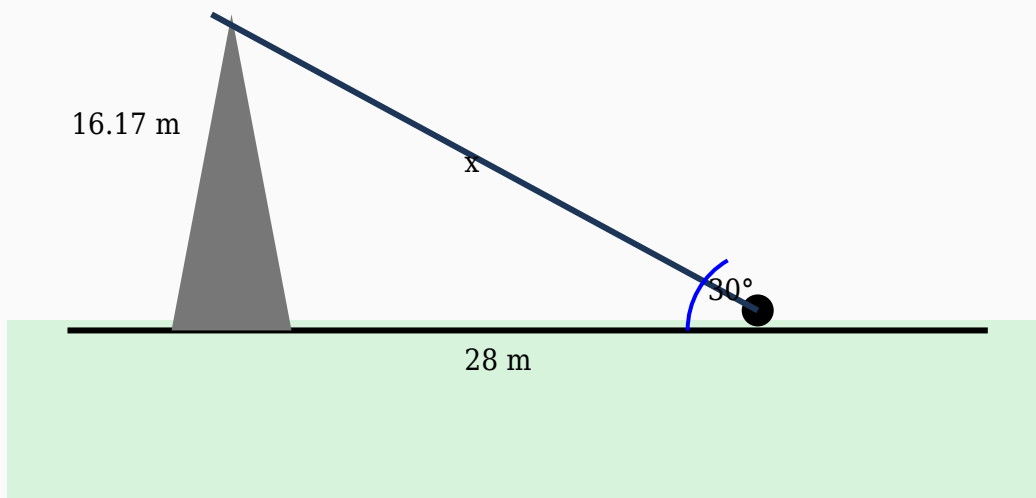
$\text{Height} = 74 \times 0.84$

$\text{Height} = 62.09 \text{ m}$

Answer: 62.09 m

Question 6

A student observes the top of a watch tower at an angle of elevation of 30° . If the horizontal distance is 28 m, find the line of sight distance.



Solution:

Using:

$\cos \theta = \text{Adjacent} / \text{Hypotenuse}$

$\cos 30^\circ = 28 / \text{Hypotenuse}$

$0.87 = 28 / \text{Hypotenuse}$

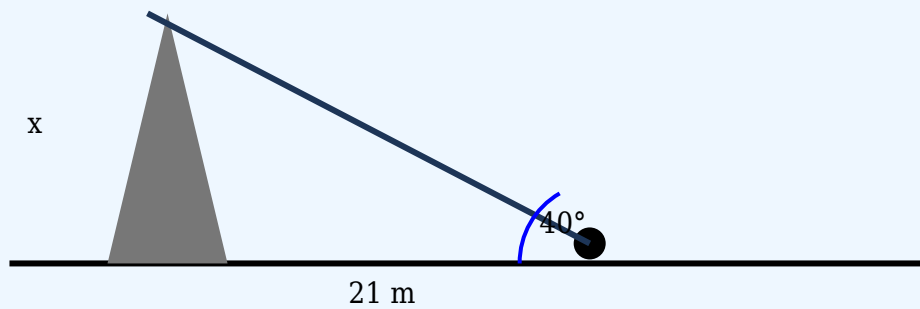
$\text{Hypotenuse} = 28 / 0.87$

$\text{Hypotenuse} = 32.18 \text{ m}$

Answer: 32.18 m

Question 7

The angle of elevation of the top of a tower from a point on the ground is 40° . If the observer is 21 m away from the tower, calculate its height.



Solution:

Using:

$\tan \theta = \text{Opposite} / \text{Adjacent}$

$\tan 40^\circ = \text{Height} / 21$

$0.84 = \text{Height} / 21$

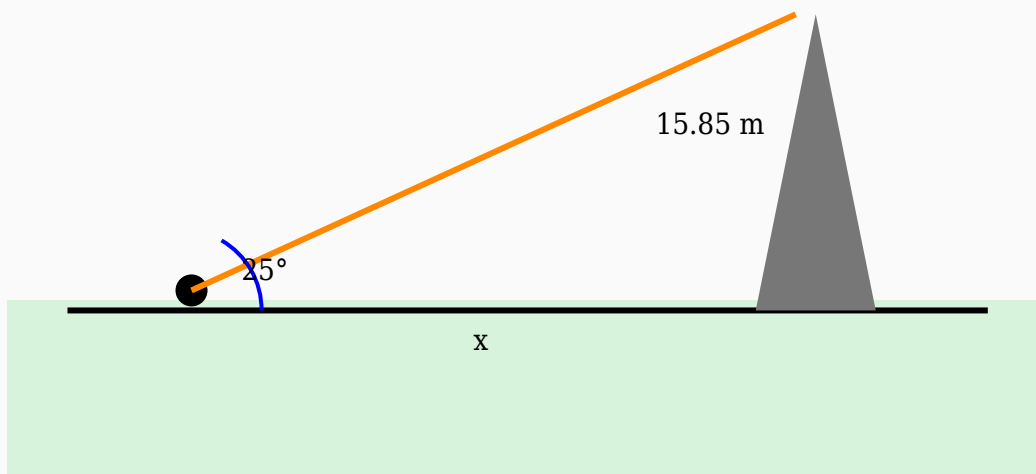
$\text{Height} = 21 \times 0.84$

$\text{Height} = 17.62 \text{ m}$

Answer: 17.62 m

Question 8

A surveyor notices the top of a bridge at an angle of elevation of 25° . Determine the horizontal distance if the height of the bridge is 15.85 m.



Solution:

Using:

$\tan \theta = \text{Opposite} / \text{Adjacent}$

$\tan 25^\circ = 15.85 / \text{Distance}$

$0.47 = 15.85 / \text{Distance}$

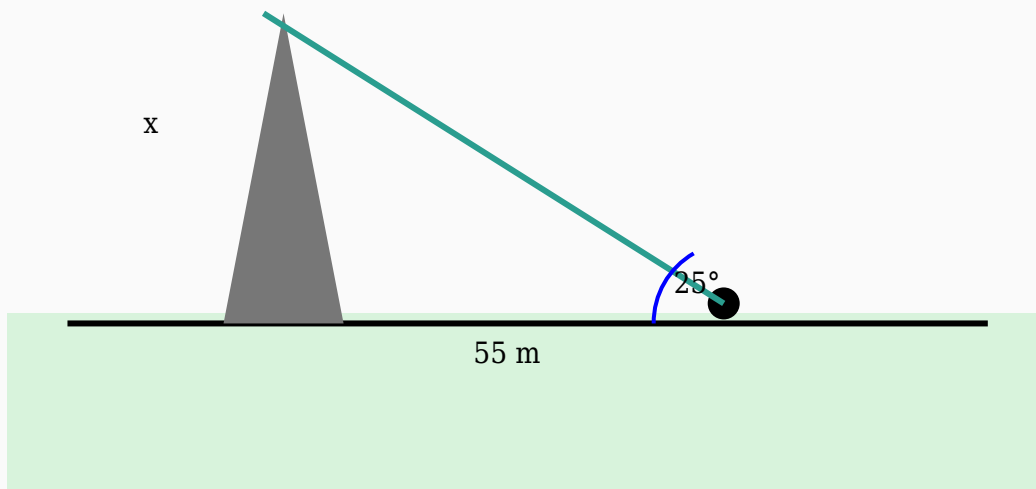
$\text{Distance} = 15.85 / 0.47$

$\text{Distance} = 33.72 \text{ m}$

Answer: 33.72 m

Question 9

A photographer standing near a tower observes its top at an angle of elevation of 25° . If the horizontal distance is 55 m, find the height of the tower.



Solution:

Using:

$\tan \theta = \text{Opposite} / \text{Adjacent}$

$\tan 25^\circ = \text{Height} / 55$

$0.47 = \text{Height} / 55$

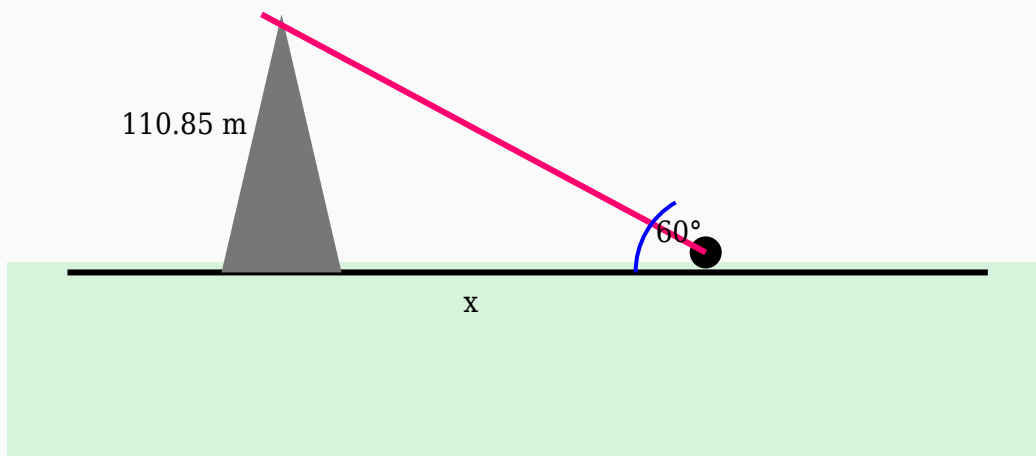
$\text{Height} = 55 \times 0.47$

$\text{Height} = 25.65 \text{ m}$

Answer: 25.65 m

Question 10

The height of a hill is 110.85 m. If the angle of elevation from a point on the ground is 60° , calculate the horizontal distance.



Solution:

Using:

$\tan \theta = \text{Opposite} / \text{Adjacent}$

$\tan 60^\circ = 110.85 / \text{Distance}$

$1.73 = 110.85 / \text{Distance}$

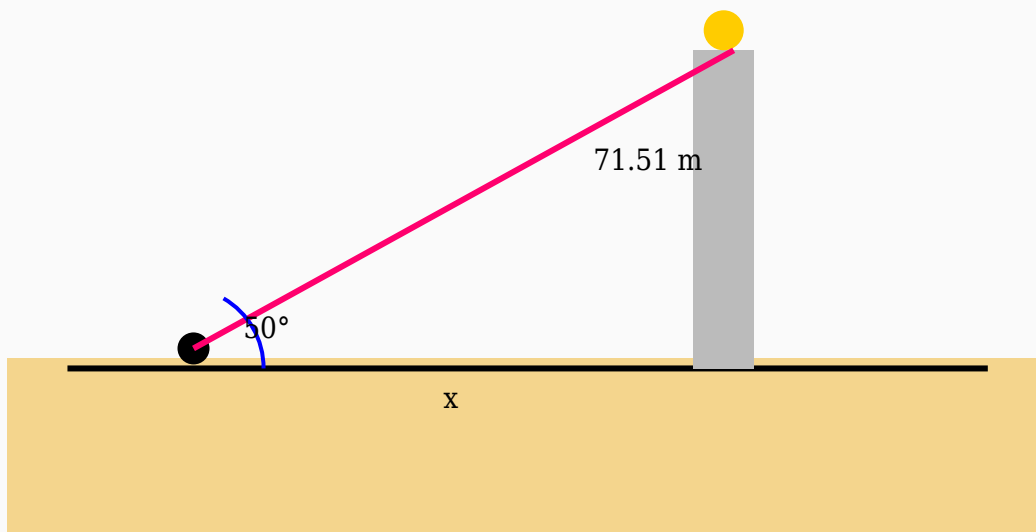
$\text{Distance} = 110.85 / 1.73$

$\text{Distance} = 64.08 \text{ m}$

Answer: 64.08 m

Question 11

A surveyor notices the top of a crane at an angle of elevation of 50° . Determine the horizontal distance if the height of the crane is 71.51 m.



Solution:

Using:

$\tan \theta = \text{Opposite} / \text{Adjacent}$

$\tan 50^\circ = 71.51 / \text{Distance}$

$1.19 = 71.51 / \text{Distance}$

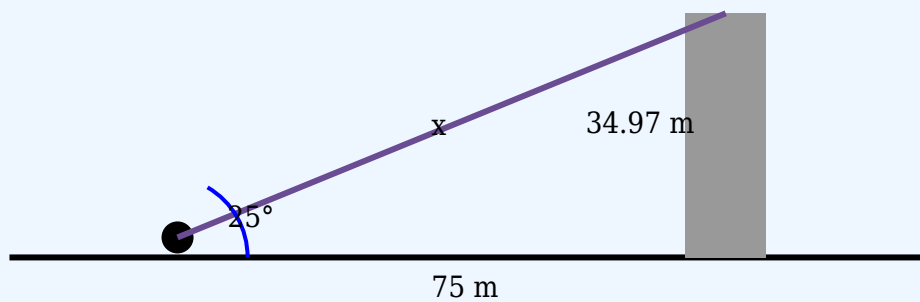
$\text{Distance} = 71.51 / 1.19$

$\text{Distance} = 60.09 \text{ m}$

Answer: 60.09 m

Question 12

A surveyor observes the top of a watch tower at an angle of elevation of 25° . If the horizontal distance is 75 m, find the line of sight distance.



Solution:

Using:

$$\cos \theta = \text{Adjacent} / \text{Hypotenuse}$$

$$\cos 25^\circ = 75 / \text{Hypotenuse}$$

$$0.91 = 75 / \text{Hypotenuse}$$

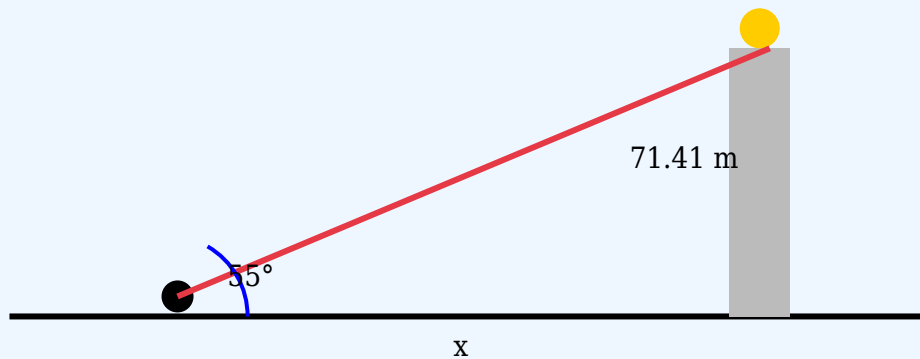
$$\text{Hypotenuse} = 75 / 0.91$$

$$\text{Hypotenuse} = 82.42 \text{ m}$$

Answer: 82.42 m

Question 13

A surveyor observes the top of a stadium light at an angle of elevation of 55° . If the height of the stadium light is 71.41 m, find the horizontal distance.



Solution:

Using:

$\tan \theta = \text{Opposite} / \text{Adjacent}$

$$\tan 55^\circ = 71.41 / \text{Distance}$$

$$1.43 = 71.41 / \text{Distance}$$

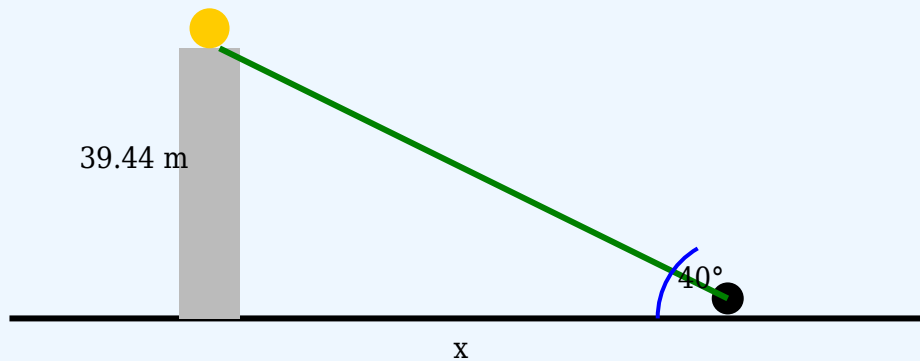
$$\text{Distance} = 71.41 / 1.43$$

$$\text{Distance} = 49.94 \text{ m}$$

Answer: 49.94 m

Question 14

The angle of elevation to the top of a electric pole is 40° . Find the distance from the observer to the base if the height is 39.44 m.



Solution:

Using:

$\tan \theta = \text{Opposite} / \text{Adjacent}$

$\tan 40^\circ = 39.44 / \text{Distance}$

$0.84 = 39.44 / \text{Distance}$

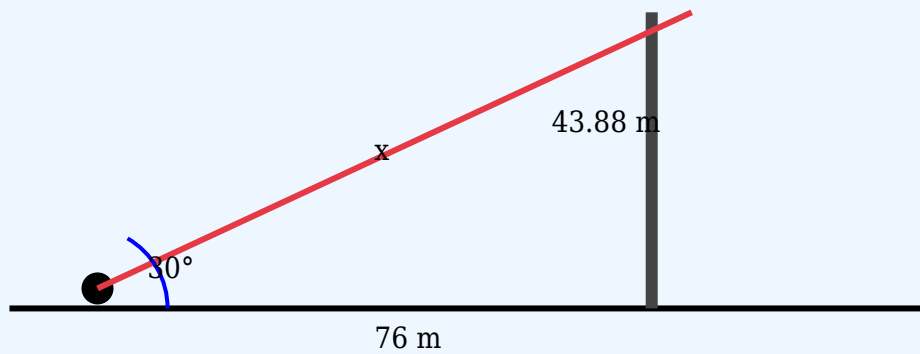
$\text{Distance} = 39.44 / 0.84$

$\text{Distance} = 46.95 \text{ m}$

Answer: 46.95 m

Question 15

The angle of elevation to the top of a lighthouse is 30° . If the observer is 76 m from the base, calculate the hypotenuse.



Solution:

Using:

$\cos \theta = \text{Adjacent} / \text{Hypotenuse}$

$\cos 30^\circ = 76 / \text{Hypotenuse}$

$0.87 = 76 / \text{Hypotenuse}$

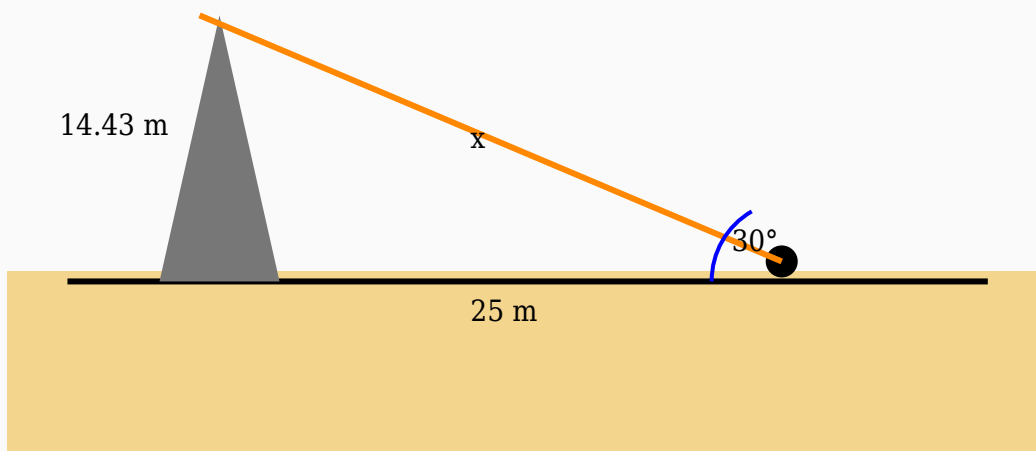
$\text{Hypotenuse} = 76 / 0.87$

$\text{Hypotenuse} = 87.36 \text{ m}$

Answer: 87.36 m

Question 16

The angle of elevation to the top of a tree is 30° . If the observer is 25 m from the base, calculate the hypotenuse.



Solution:

Using:

$\cos \theta = \text{Adjacent} / \text{Hypotenuse}$

$\cos 30^\circ = 25 / \text{Hypotenuse}$

$0.87 = 25 / \text{Hypotenuse}$

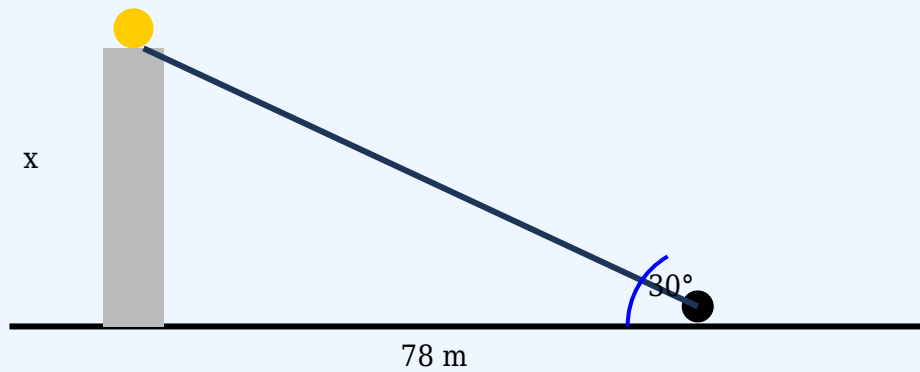
$\text{Hypotenuse} = 25 / 0.87$

$\text{Hypotenuse} = 28.74 \text{ m}$

Answer: 28.74 m

Question 17

The angle of elevation of the top of a mountain from a point on the ground is 30° . If the observer is 78 m away from the mountain, calculate its height.



Solution:

Using:

$\tan \theta = \text{Opposite} / \text{Adjacent}$

$\tan 30^\circ = \text{Height} / 78$

$0.58 = \text{Height} / 78$

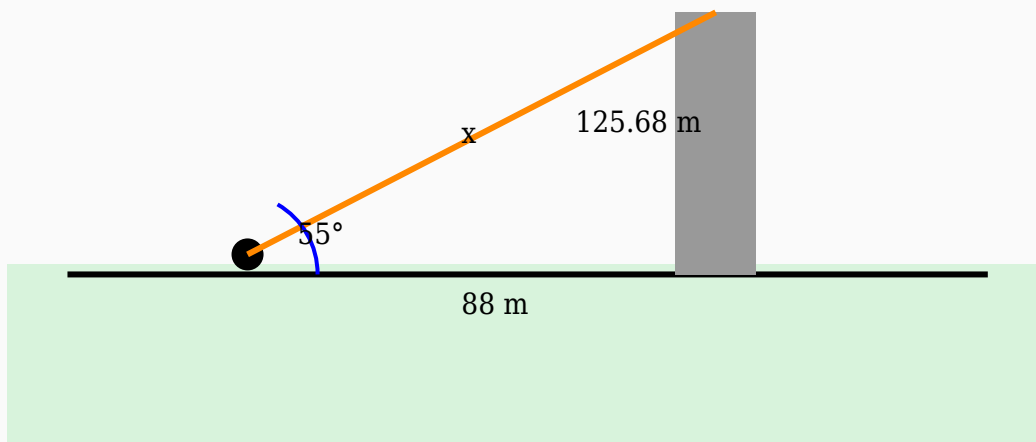
$\text{Height} = 78 \times 0.58$

$\text{Height} = 45.03 \text{ m}$

Answer: 45.03 m

Question 18

A person standing 88 m away from a lighthouse observes its top at an angle of elevation of 55° . Find the line of sight.



Solution:

Using:

$\cos \theta = \text{Adjacent} / \text{Hypotenuse}$

$\cos 55^\circ = 88 / \text{Hypotenuse}$

$0.57 = 88 / \text{Hypotenuse}$

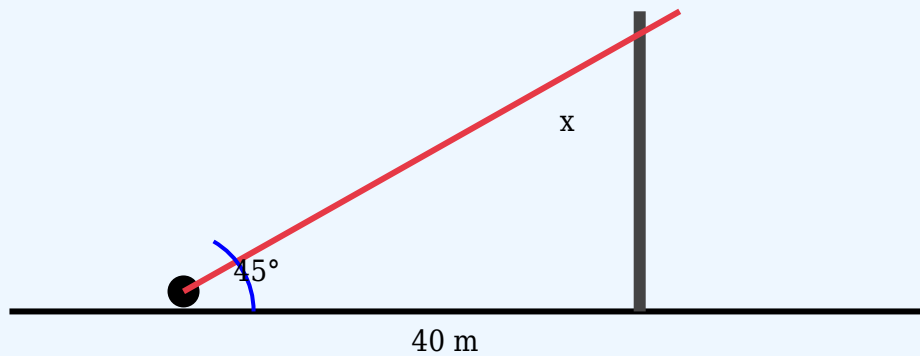
$\text{Hypotenuse} = 88 / 0.57$

$\text{Hypotenuse} = 154.39 \text{ m}$

Answer: 154.39 m

Question 19

A man looks at the top of a flagpole at an angle of elevation of 45° . Find the height of the flagpole if the distance from the base is 40 m.



Solution:

Using:

$\tan \theta = \text{Opposite} / \text{Adjacent}$

$\tan 45^\circ = \text{Height} / 40$

$1 = \text{Height} / 40$

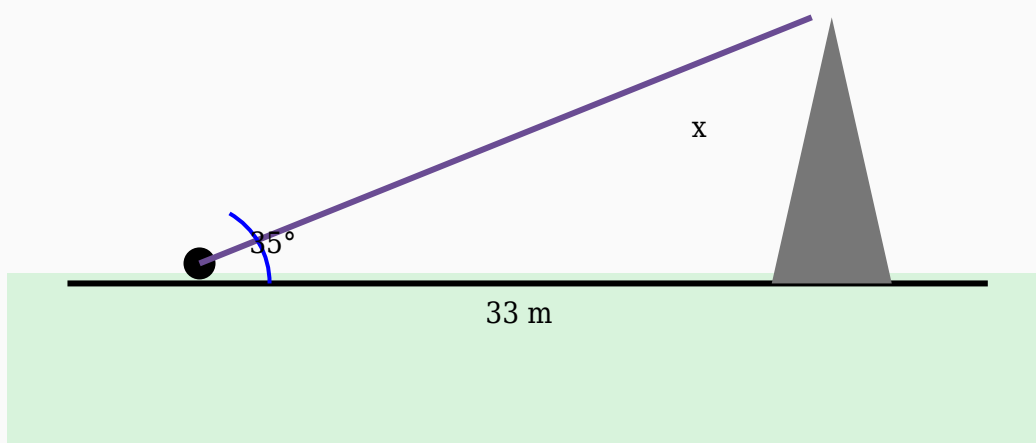
$\text{Height} = 40 \times 1$

$\text{Height} = 40 \text{ m}$

Answer: 40 m

Question 20

A man standing near a stadium light observes its top at an angle of elevation of 35° . If the horizontal distance is 33 m, find the height of the stadium light.



Solution:

Using:

$\tan \theta = \text{Opposite} / \text{Adjacent}$

$\tan 35^\circ = \text{Height} / 33$

$0.7 = \text{Height} / 33$

$\text{Height} = 33 \times 0.7$

$\text{Height} = 23.11 \text{ m}$

Answer: 23.11 m