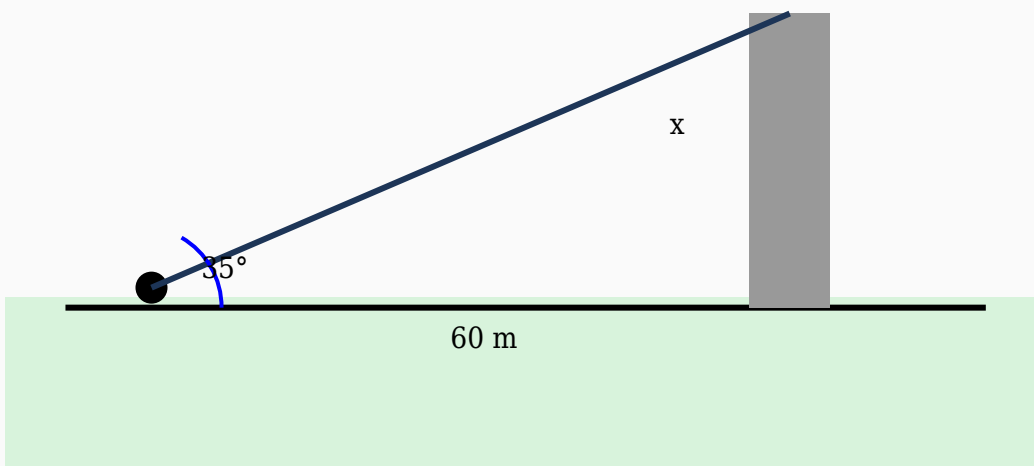


Angle of Elevation Solved Worksheet

Question 1

The angle of elevation of the top of a electric pole from a point on the ground is 35° . If the observer is 60 m away from the electric pole, calculate its height.



Solution:

Using:

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

$$\tan 35^\circ = \text{Height} / 60$$

$$0.7 = \text{Height} / 60$$

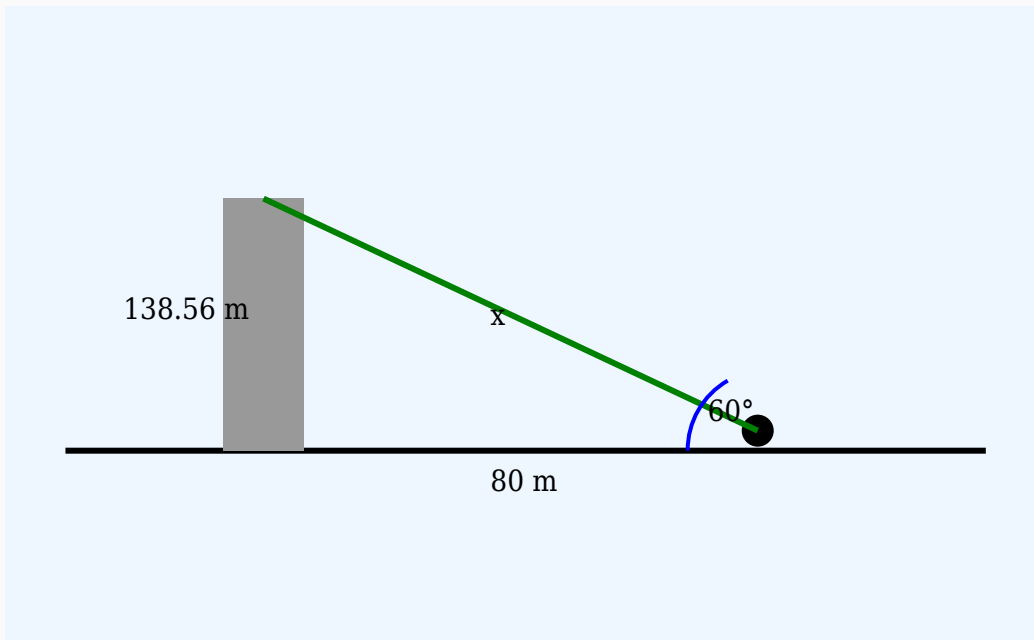
$$\text{Height} = 60 \times 0.7$$

$$\text{Height} = 42.01 \text{ m}$$

Answer: 42.01 m

Question 2

An observer observes the top of a tower at an angle of elevation of 60° . If the horizontal distance is 80 m, find the line of sight distance.



Solution:

Using:

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

$$\cos 60^\circ = 80 / \text{Hypotenuse}$$

$$0.5 = 80 / \text{Hypotenuse}$$

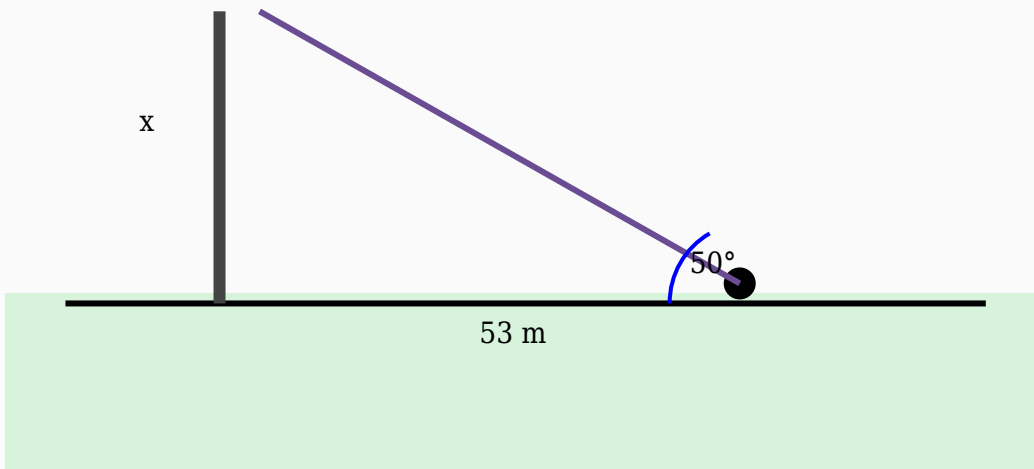
$$\text{Hypotenuse} = 80 / 0.5$$

$$\text{Hypotenuse} = 160 \text{ m}$$

Answer: 160 m

Question 3

A man looks at the top of a bridge at an angle of elevation of 50° . Find the height of the bridge if the distance from the base is 53 m.



Solution:

Using:

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

$\tan 50^\circ = \text{Height} / 53$

$1.19 = \text{Height} / 53$

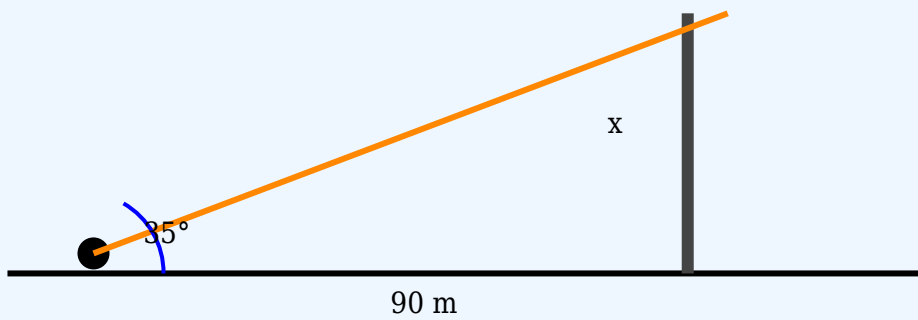
$\text{Height} = 53 \times 1.19$

$\text{Height} = 63.16 \text{ m}$

Answer: 63.16 m

Question 4

A person measures the angle of elevation to the top of a mountain as 35° . If the distance from the mountain is 90 m, determine its height.



Solution:

Using:

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

$\tan 35^\circ = \text{Height} / 90$

$0.7 = \text{Height} / 90$

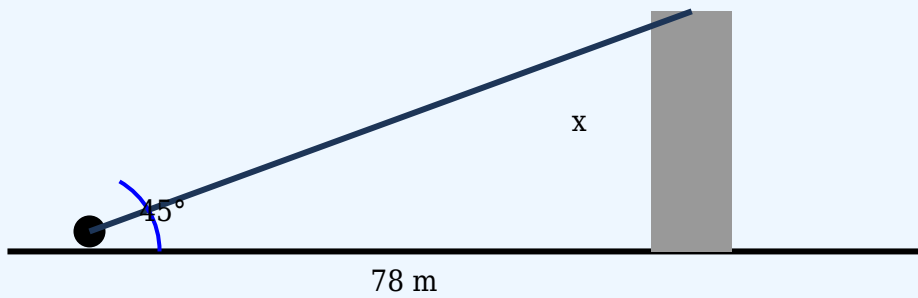
$\text{Height} = 90 \times 0.7$

$\text{Height} = 63.02 \text{ m}$

Answer: 63.02 m

Question 5

A woman standing near a hill observes its top at an angle of elevation of 45° . If the horizontal distance is 78 m, find the height of the hill.



Solution:

Using:

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

$\tan 45^\circ = \text{Height} / 78$

$1 = \text{Height} / 78$

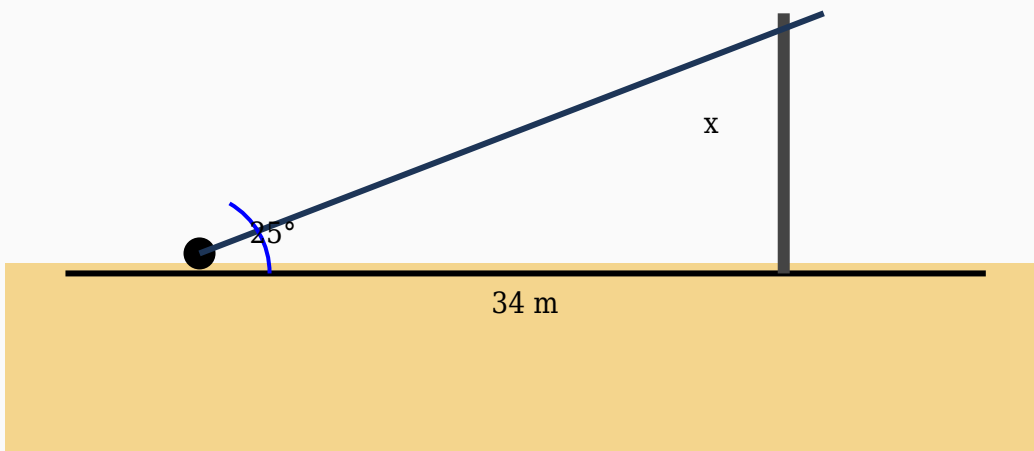
$\text{Height} = 78 \times 1$

$\text{Height} = 78 \text{ m}$

Answer: 78 m

Question 6

A girl looks at the top of a water tank at an angle of elevation of 25° . Find the height of the water tank if the distance from the base is 34 m.



Solution:

Using:

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

$\tan 25^\circ = \text{Height} / 34$

$0.47 = \text{Height} / 34$

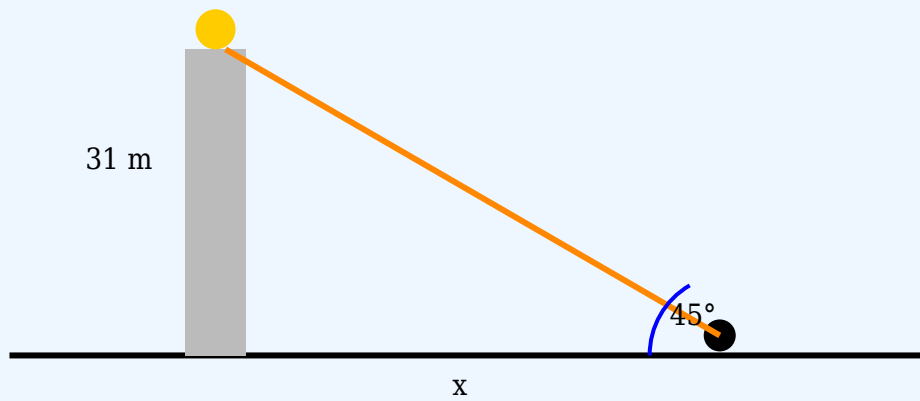
$\text{Height} = 34 \times 0.47$

$\text{Height} = 15.85 \text{ m}$

Answer: 15.85 m

Question 7

A tourist observes the top of a lighthouse at an angle of elevation of 45° . If the height of the lighthouse is 31 m, find the horizontal distance.



Solution:

Using:

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

$\tan 45^\circ = 31 / \text{Distance}$

$1 = 31 / \text{Distance}$

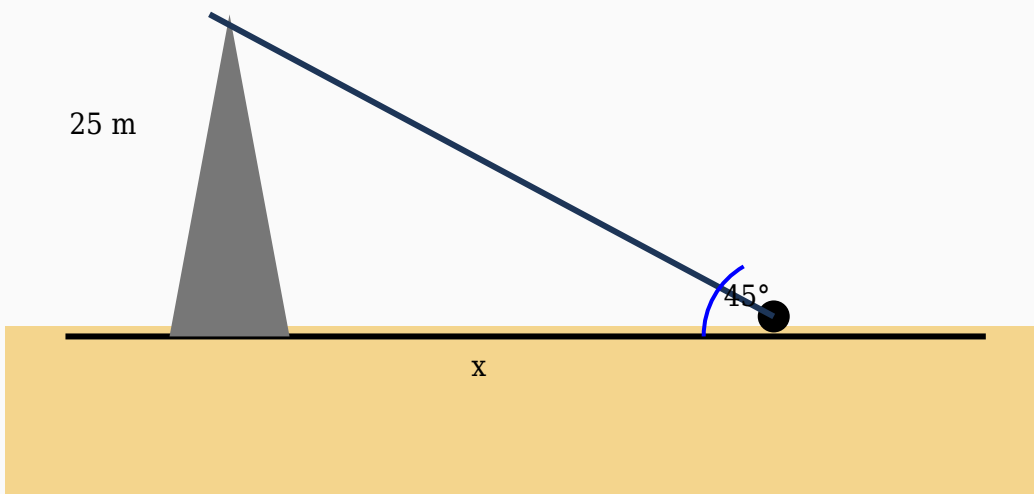
$\text{Distance} = 31 / 1$

$\text{Distance} = 31 \text{ m}$

Answer: 31 m

Question 8

A surveyor notices the top of a mountain at an angle of elevation of 45° . Determine the horizontal distance if the height of the mountain is 25 m.



Solution:

Using:

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

$\tan 45^\circ = 25 / \text{Distance}$

$1 = 25 / \text{Distance}$

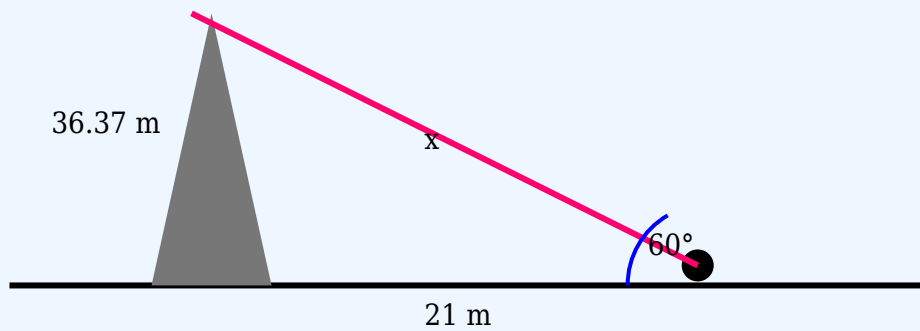
$\text{Distance} = 25 / 1$

$\text{Distance} = 25 \text{ m}$

Answer: 25 m

Question 9

An observer looks at the top of a mountain making an angle of elevation of 60° . Determine the length of the line of sight if the horizontal distance is 21 m.



Solution:

Using:

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

$$\cos 60^\circ = 21 / \text{Hypotenuse}$$

$$0.5 = 21 / \text{Hypotenuse}$$

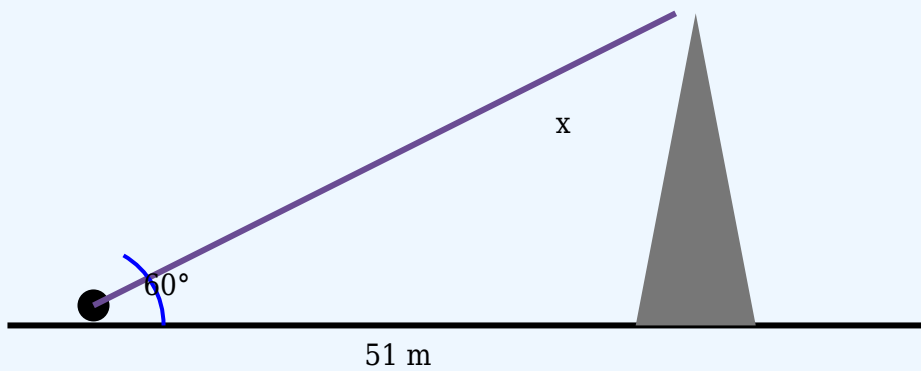
$$\text{Hypotenuse} = 21 / 0.5$$

$$\text{Hypotenuse} = 42 \text{ m}$$

Answer: 42 m

Question 10

A boy looks at the top of a tower at an angle of elevation of 60° . Find the height of the tower if the distance from the base is 51 m.



Solution:

Using:

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

$\tan 60^\circ = \text{Height} / 51$

$1.73 = \text{Height} / 51$

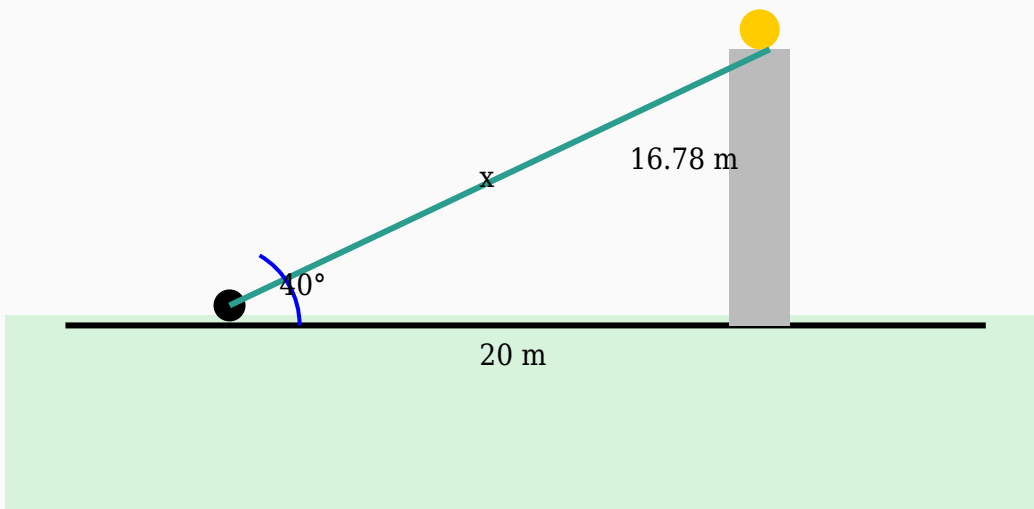
$\text{Height} = 51 \times 1.73$

$\text{Height} = 88.33 \text{ m}$

Answer: 88.33 m

Question 11

A woman observes the top of a hill at an angle of elevation of 40° . If the horizontal distance is 20 m, find the line of sight distance.



Solution:

Using:

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

$$\cos 40^\circ = 20 / \text{Hypotenuse}$$

$$0.77 = 20 / \text{Hypotenuse}$$

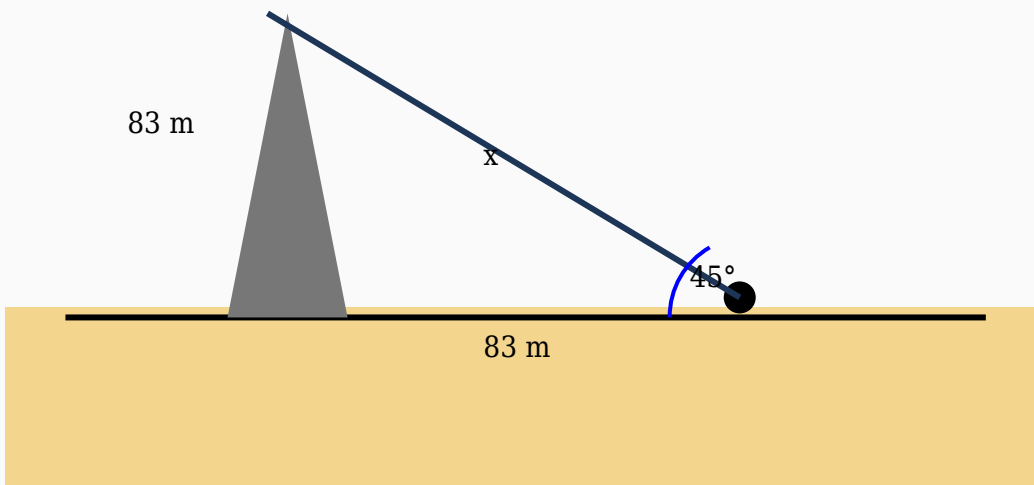
$$\text{Hypotenuse} = 20 / 0.77$$

$$\text{Hypotenuse} = 25.97 \text{ m}$$

Answer: 25.97 m

Question 12

An observer looks at the top of a tree making an angle of elevation of 45° . Determine the length of the line of sight if the horizontal distance is 83 m.



Solution:

Using:

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

$$\cos 45^\circ = 83 / \text{Hypotenuse}$$

$$0.71 = 83 / \text{Hypotenuse}$$

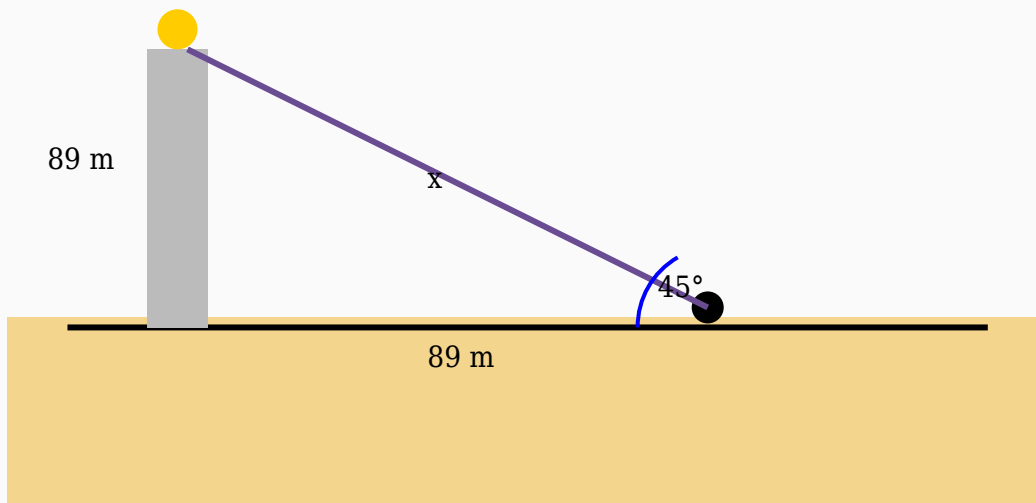
$$\text{Hypotenuse} = 83 / 0.71$$

$$\text{Hypotenuse} = 116.9 \text{ m}$$

Answer: 116.9 m

Question 13

A traveller observes the top of a water tank at an angle of elevation of 45° . If the horizontal distance is 89 m, find the line of sight distance.



Solution:

Using:

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

$$\cos 45^\circ = 89 / \text{Hypotenuse}$$

$$0.71 = 89 / \text{Hypotenuse}$$

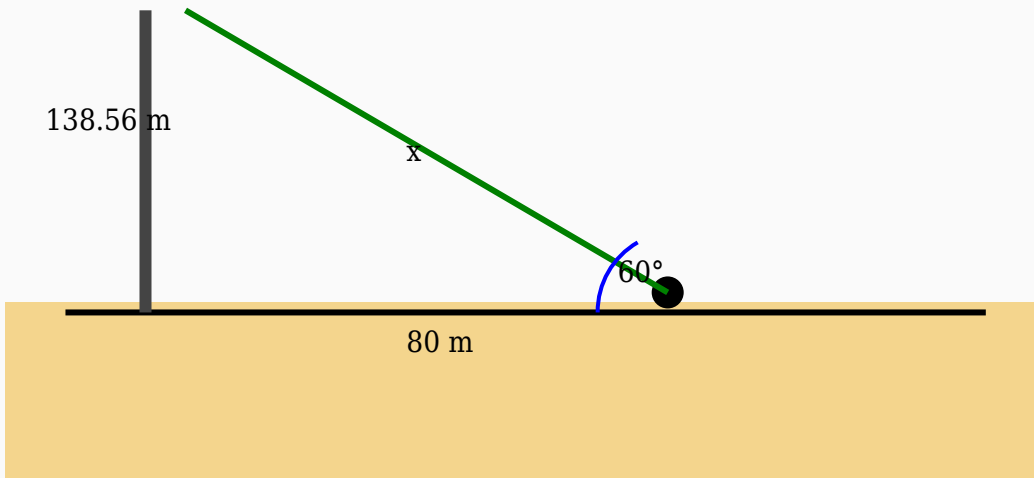
$$\text{Hypotenuse} = 89 / 0.71$$

$$\text{Hypotenuse} = 125.35 \text{ m}$$

Answer: 125.35 m

Question 14

A person standing 80 m away from a crane observes its top at an angle of elevation of 60° . Find the line of sight.



Solution:

Using:

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

$$\cos 60^\circ = 80 / \text{Hypotenuse}$$

$$0.5 = 80 / \text{Hypotenuse}$$

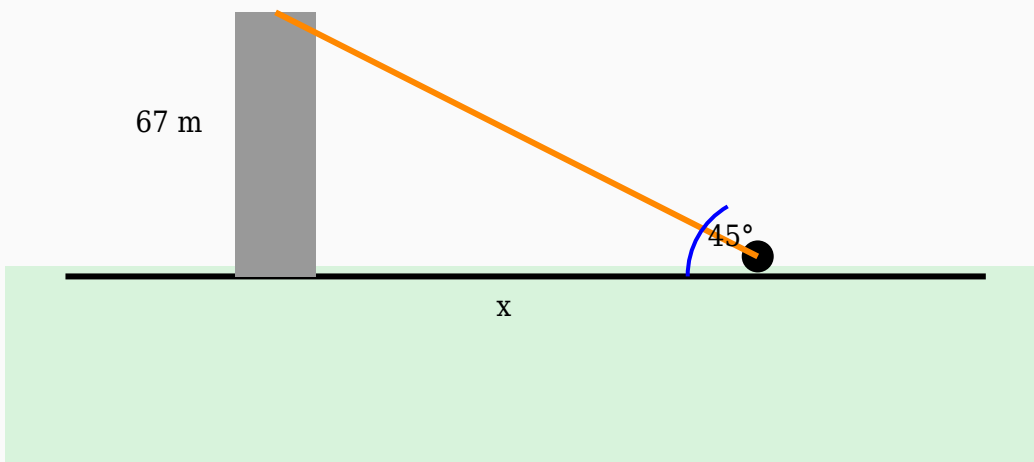
$$\text{Hypotenuse} = 80 / 0.5$$

$$\text{Hypotenuse} = 160 \text{ m}$$

Answer: 160 m

Question 15

A woman observes the top of a crane at an angle of elevation of 45° . If the height of the crane is 67 m, find the horizontal distance.



Solution:

Using:

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

$\tan 45^\circ = 67 / \text{Distance}$

$1 = 67 / \text{Distance}$

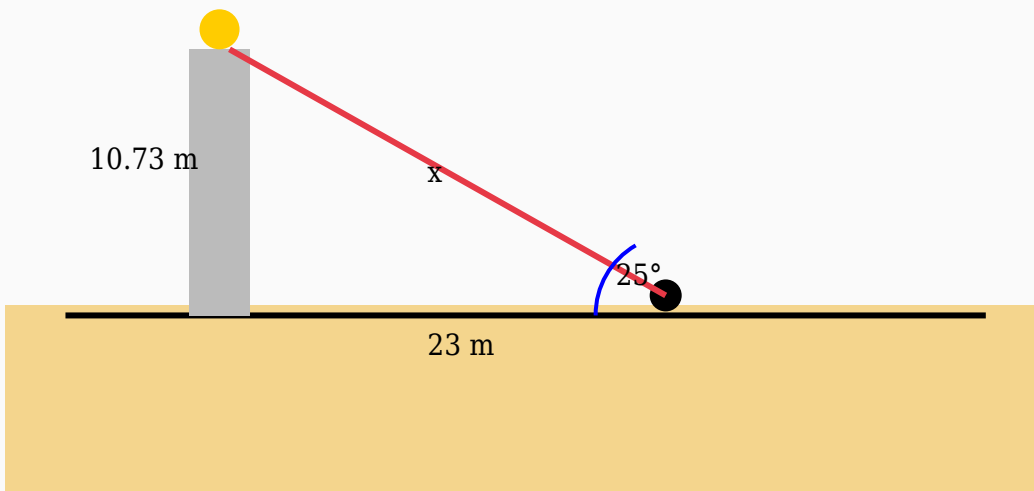
$\text{Distance} = 67 / 1$

$\text{Distance} = 67 \text{ m}$

Answer: 67 m

Question 16

A photographer observes the top of a electric pole at an angle of elevation of 25° . If the horizontal distance is 23 m, find the line of sight distance.



Solution:

Using:

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

$$\cos 25^\circ = 23 / \text{Hypotenuse}$$

$$0.91 = 23 / \text{Hypotenuse}$$

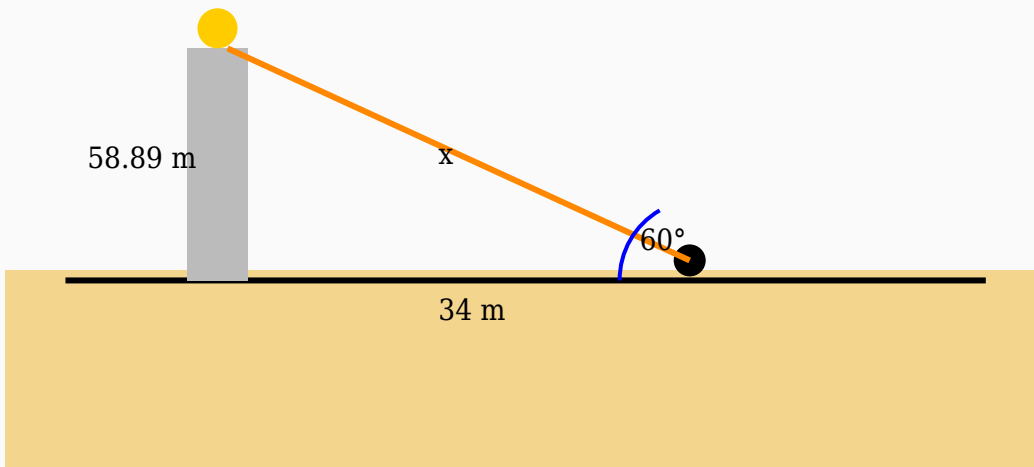
$$\text{Hypotenuse} = 23 / 0.91$$

$$\text{Hypotenuse} = 25.27 \text{ m}$$

Answer: 25.27 m

Question 17

An observer observes the top of a building at an angle of elevation of 60° . If the horizontal distance is 34 m, find the line of sight distance.



Solution:

Using:

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

$\cos 60^\circ = 34 / \text{Hypotenuse}$

$0.5 = 34 / \text{Hypotenuse}$

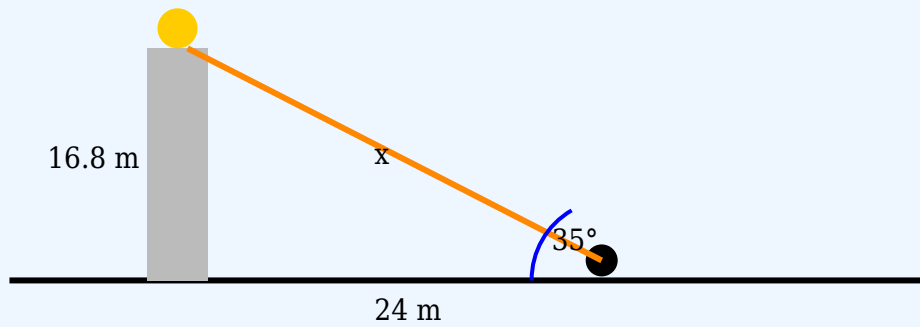
$\text{Hypotenuse} = 34 / 0.5$

$\text{Hypotenuse} = 68 \text{ m}$

Answer: 68 m

Question 18

A photographer observes the top of a stadium light at an angle of elevation of 35° . If the horizontal distance is 24 m, find the line of sight distance.



Solution:

Using:

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

$$\cos 35^\circ = 24 / \text{Hypotenuse}$$

$$0.82 = 24 / \text{Hypotenuse}$$

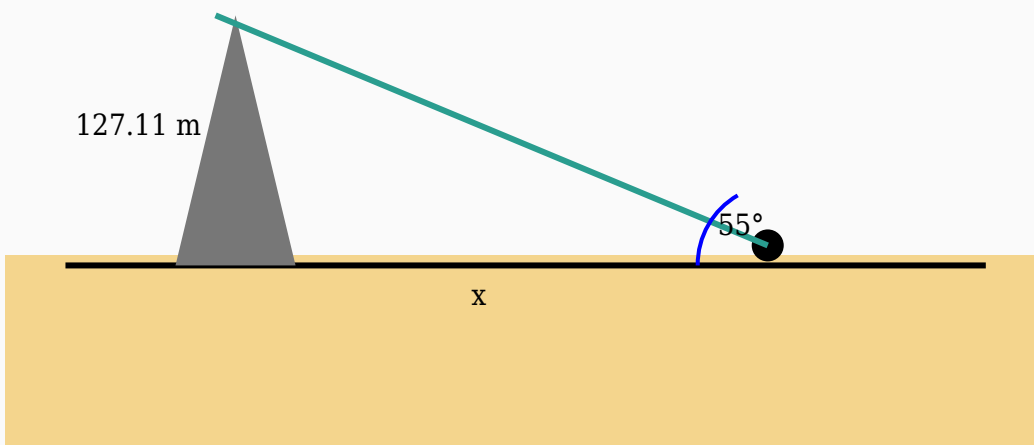
$$\text{Hypotenuse} = 24 / 0.82$$

$$\text{Hypotenuse} = 29.27 \text{ m}$$

Answer: 29.27 m

Question 19

The angle of elevation to the top of a lighthouse is 55° . Find the distance from the observer to the base if the height is 127.11 m.



Solution:

Using:

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

$\tan 55^\circ = 127.11 / \text{Distance}$

$1.43 = 127.11 / \text{Distance}$

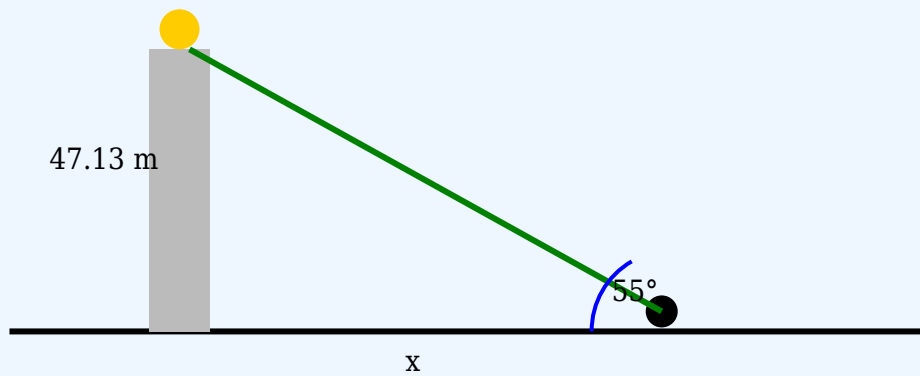
$\text{Distance} = 127.11 / 1.43$

$\text{Distance} = 88.89 \text{ m}$

Answer: 88.89 m

Question 20

The height of a mountain is 47.13 m. If the angle of elevation from a point on the ground is 55° , calculate the horizontal distance.



Solution:

Using:

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

$\tan 55^\circ = 47.13 / \text{Distance}$

$1.43 = 47.13 / \text{Distance}$

$\text{Distance} = 47.13 / 1.43$

$\text{Distance} = 32.96 \text{ m}$

Answer: 32.96 m