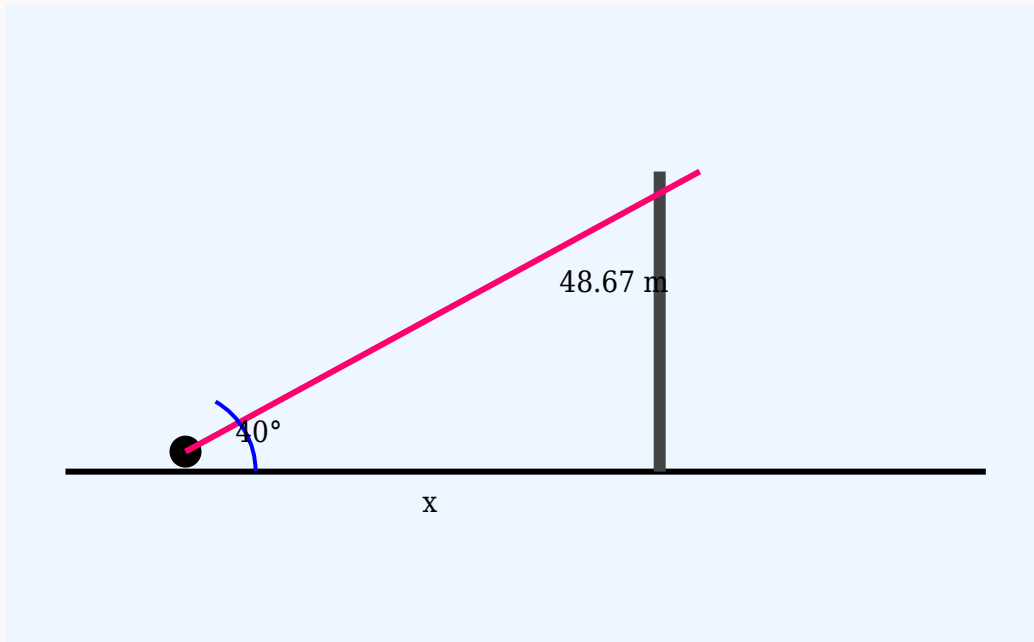


Angle of Elevation Solved Worksheet

Question 1

The angle of elevation to the top of a watch tower is 40° . Find the distance from the observer to the base if the height is 48.67 m.



Solution:

Using:

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

$$\tan 40^\circ = 48.67 / \text{Distance}$$

$$0.84 = 48.67 / \text{Distance}$$

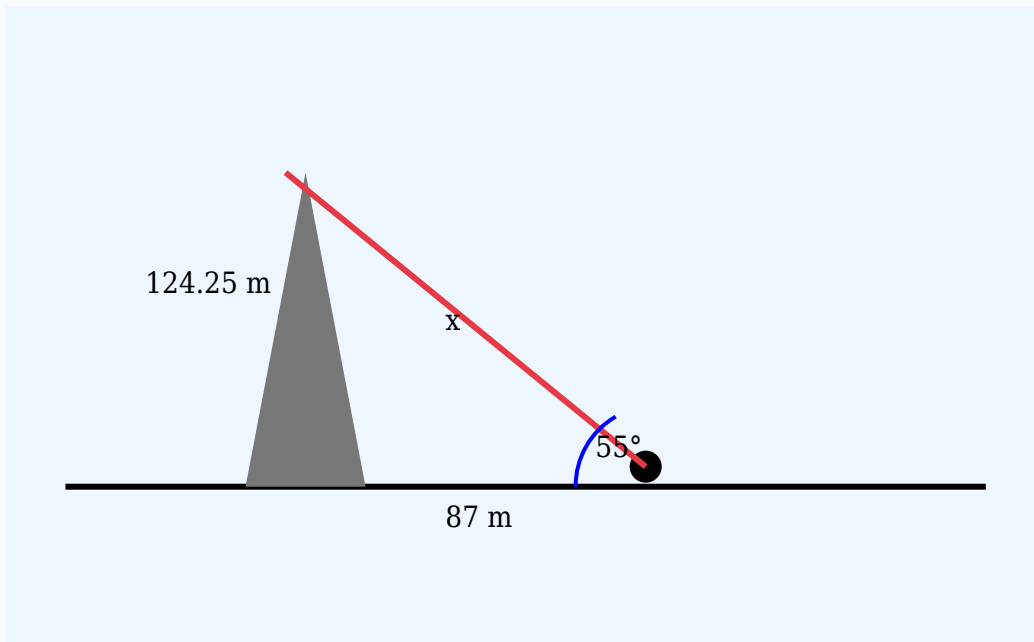
$$\text{Distance} = 48.67 / 0.84$$

$$\text{Distance} = 57.94 \text{ m}$$

Answer: 57.94 m

Question 2

A traveller observes the top of a mobile tower at an angle of elevation of 55° . If the horizontal distance is 87 m, find the line of sight distance.



Solution:

Using:

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

$$\cos 55^\circ = 87 / \text{Hypotenuse}$$

$$0.57 = 87 / \text{Hypotenuse}$$

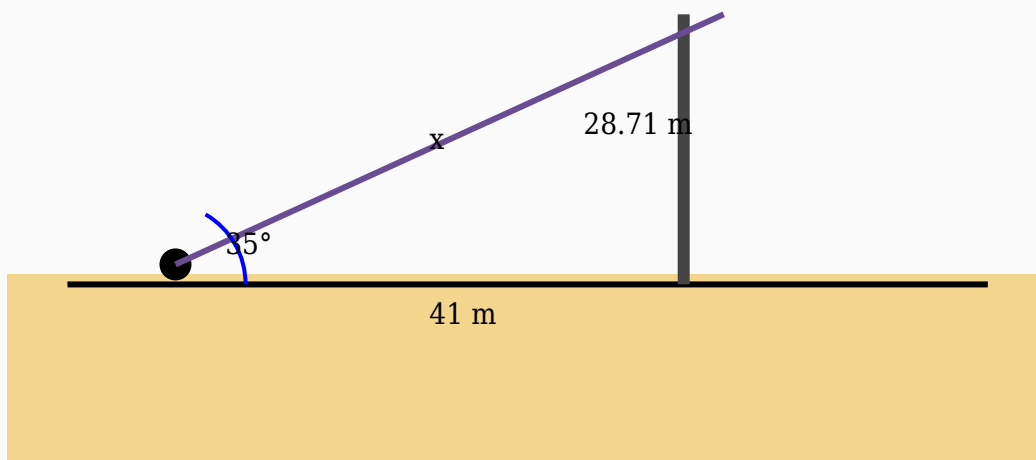
$$\text{Hypotenuse} = 87 / 0.57$$

$$\text{Hypotenuse} = 152.63 \text{ m}$$

Answer: 152.63 m

Question 3

The angle of elevation to the top of a electric pole is 35° . If the observer is 41 m from the base, calculate the hypotenuse.



Solution:

Using:

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

$\cos 35^\circ = 41 / \text{Hypotenuse}$

$0.82 = 41 / \text{Hypotenuse}$

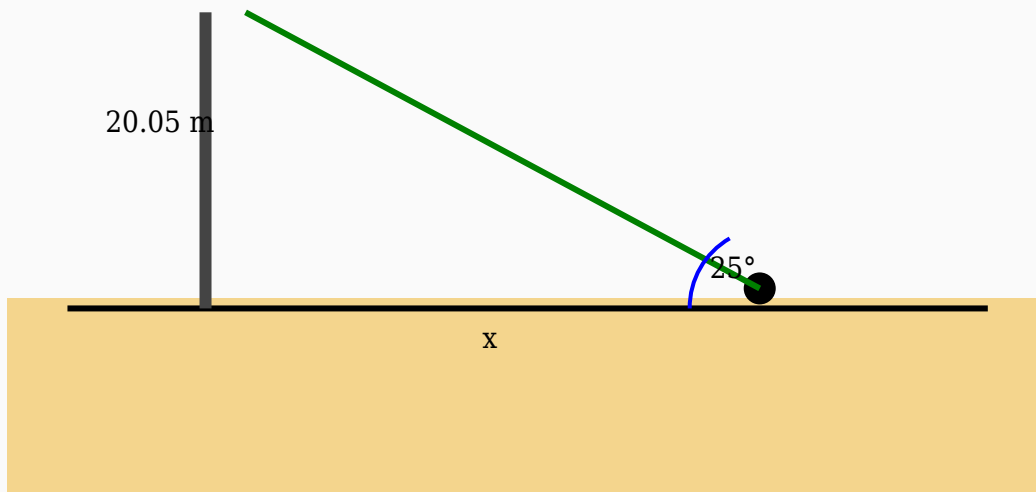
$\text{Hypotenuse} = 41 / 0.82$

$\text{Hypotenuse} = 50 \text{ m}$

Answer: 50 m

Question 4

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 20.05 m.



Solution:

Using:

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

$\tan 25^\circ = 20.05 / \text{Distance}$

$0.47 = 20.05 / \text{Distance}$

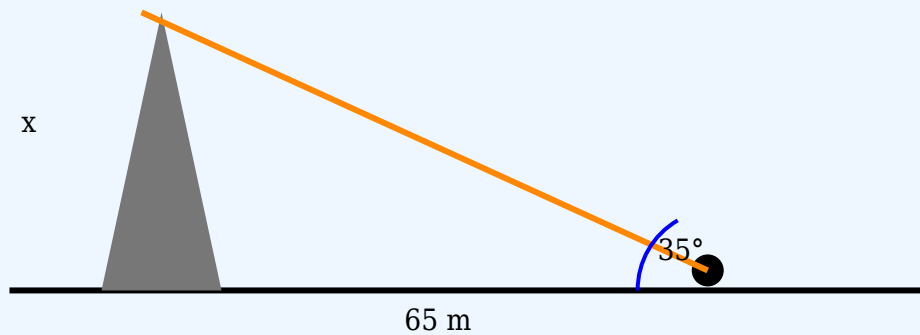
$\text{Distance} = 20.05 / 0.47$

$\text{Distance} = 42.66 \text{ m}$

Answer: 42.66 m

Question 5

A person measures the angle of elevation to the top of a stadium light as 35° . If the distance from the stadium light is 65 m, determine its height.



Solution:

Using:

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

$\tan 35^\circ = \text{Height} / 65$

$0.7 = \text{Height} / 65$

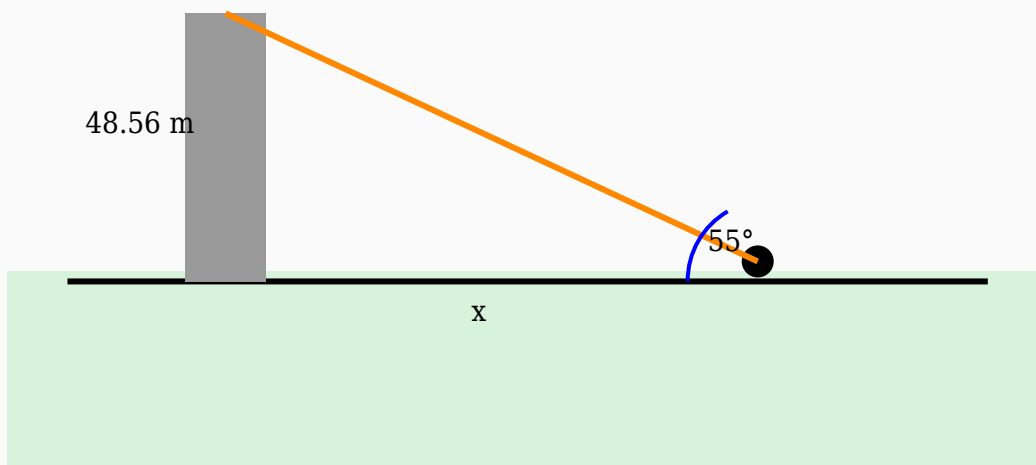
$\text{Height} = 65 \times 0.7$

$\text{Height} = 45.51 \text{ m}$

Answer: 45.51 m

Question 6

A photographer observes the top of a hill at an angle of elevation of 55° . If the height of the hill is 48.56 m, find the horizontal distance.



Solution:

Using:

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

$\tan 55^\circ = 48.56 / \text{Distance}$

$1.43 = 48.56 / \text{Distance}$

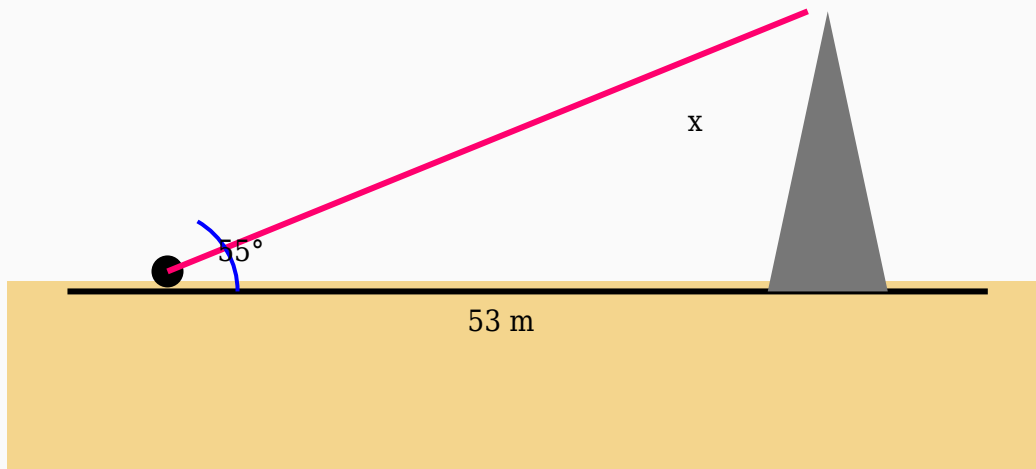
$\text{Distance} = 48.56 / 1.43$

$\text{Distance} = 33.96 \text{ m}$

Answer: 33.96 m

Question 7

The angle of elevation of the top of a flagpole from a point on the ground is 55° . If the observer is 53 m away from the flagpole, calculate its height.



Solution:

Using:

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

$\tan 55^\circ = \text{Height} / 53$

$1.43 = \text{Height} / 53$

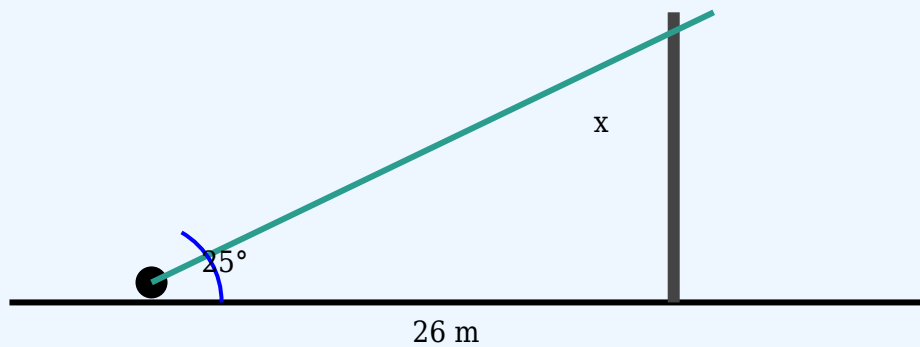
$\text{Height} = 53 \times 1.43$

$\text{Height} = 75.69 \text{ m}$

Answer: 75.69 m

Question 8

A photographer 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 26 m.



Solution:

Using:

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

$\tan 25^\circ = \text{Height} / 26$

$0.47 = \text{Height} / 26$

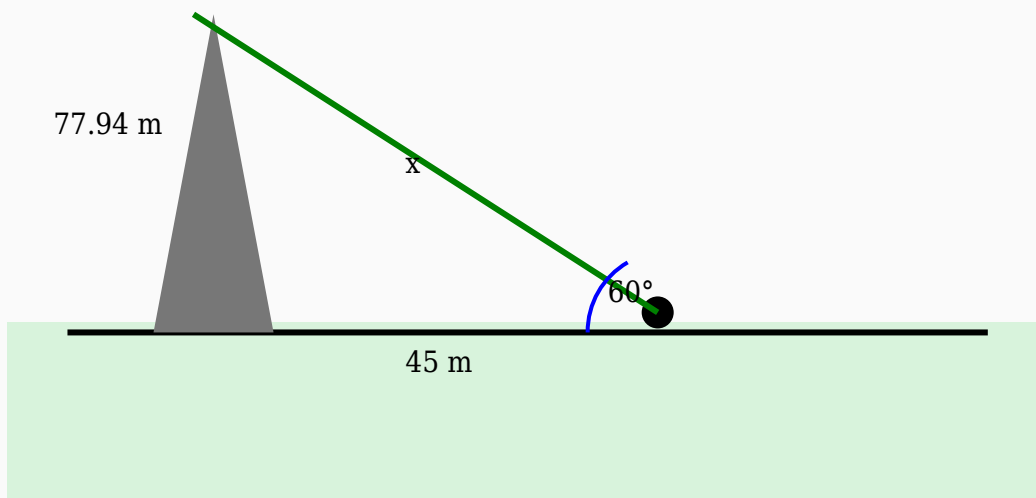
$\text{Height} = 26 \times 0.47$

$\text{Height} = 12.12 \text{ m}$

Answer: 12.12 m

Question 9

A surveyor observes the top of a bridge at an angle of elevation of 60° . If the horizontal distance is 45 m, find the line of sight distance.



Solution:

Using:

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

$$\cos 60^\circ = 45 / \text{Hypotenuse}$$

$$0.5 = 45 / \text{Hypotenuse}$$

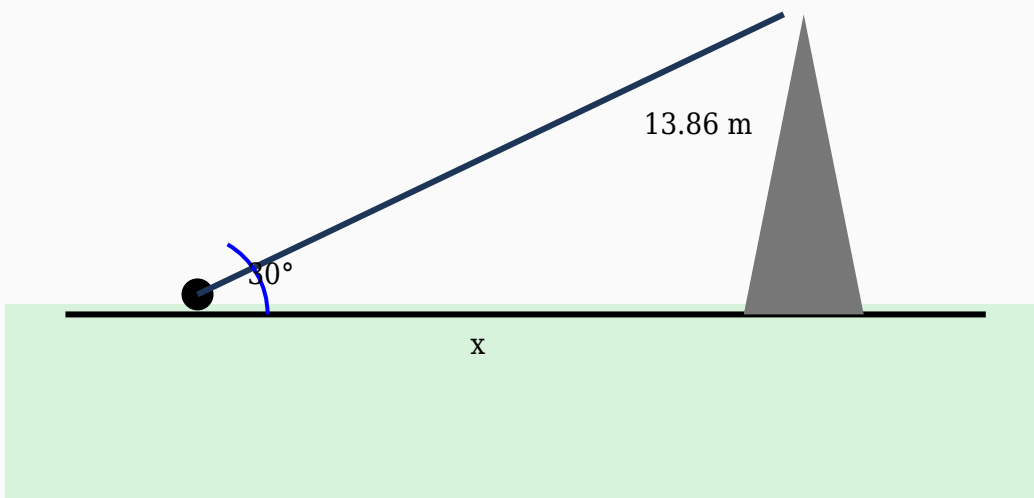
$$\text{Hypotenuse} = 45 / 0.5$$

$$\text{Hypotenuse} = 90 \text{ m}$$

Answer: 90 m

Question 10

The angle of elevation to the top of a stadium light is 30° . Find the distance from the observer to the base if the height is 13.86 m.



Solution:

Using:

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

$\tan 30^\circ = 13.86 / \text{Distance}$

$0.58 = 13.86 / \text{Distance}$

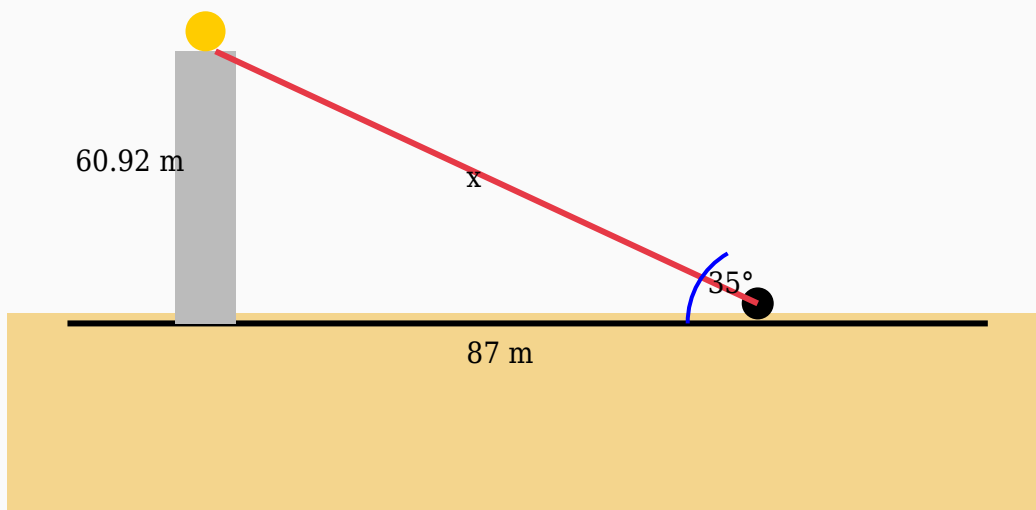
$\text{Distance} = 13.86 / 0.58$

$\text{Distance} = 23.9 \text{ m}$

Answer: 23.9 m

Question 11

An observer looks at the top of a stadium light making an angle of elevation of 35° . Determine the length of the line of sight if the horizontal distance is 87 m.



Solution:

Using:

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

$\cos 35^\circ = 87 / \text{Hypotenuse}$

$0.82 = 87 / \text{Hypotenuse}$

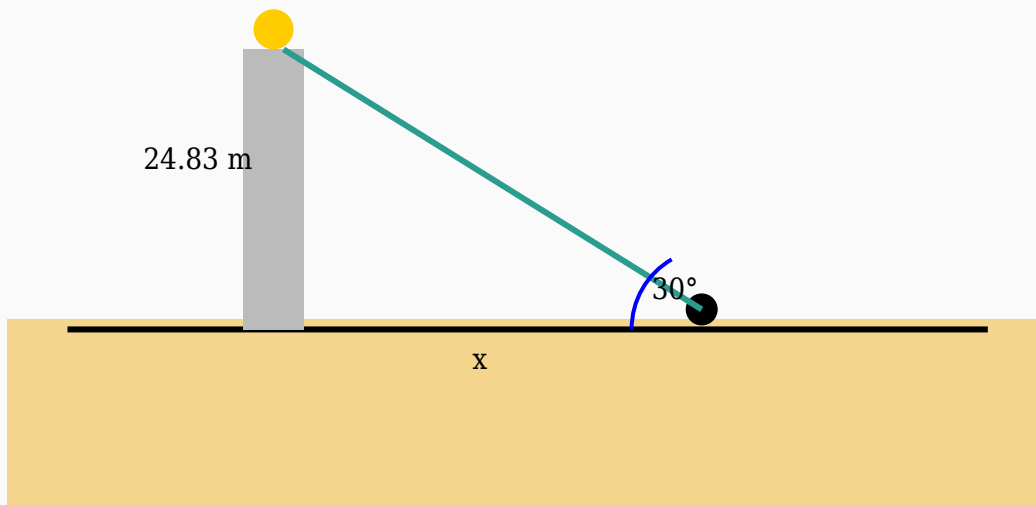
$\text{Hypotenuse} = 87 / 0.82$

$\text{Hypotenuse} = 106.1 \text{ m}$

Answer: 106.1 m

Question 12

The height of a tree is 24.83 m. If the angle of elevation from a point on the ground is 30° , calculate the horizontal distance.



Solution:

Using:

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

$\tan 30^\circ = 24.83 / \text{Distance}$

$0.58 = 24.83 / \text{Distance}$

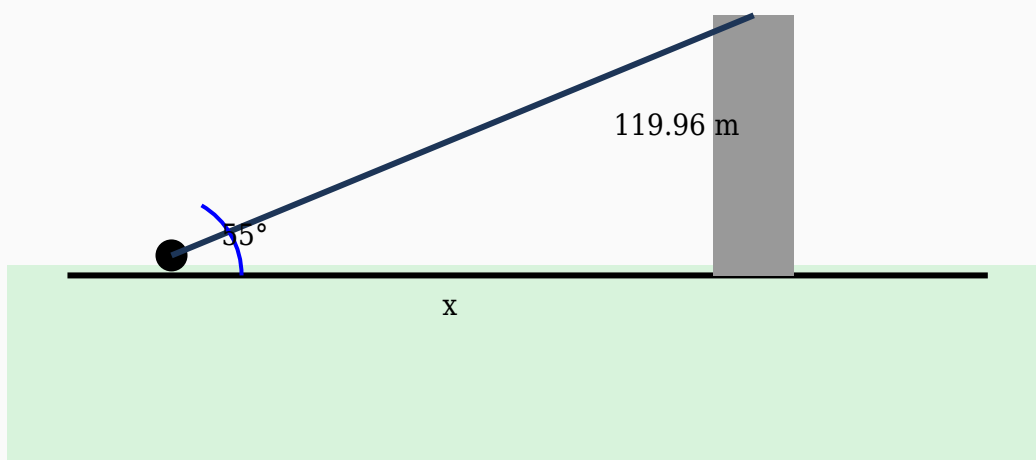
$\text{Distance} = 24.83 / 0.58$

$\text{Distance} = 42.81 \text{ m}$

Answer: 42.81 m

Question 13

A boy observes the top of a watch tower at an angle of elevation of 55° . If the height of the watch tower is 119.96 m, find the horizontal distance.



Solution:

Using:

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

$\tan 55^\circ = 119.96 / \text{Distance}$

$1.43 = 119.96 / \text{Distance}$

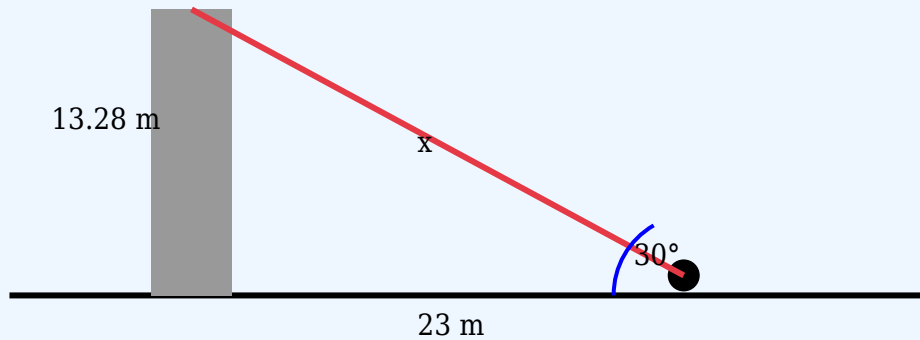
$\text{Distance} = 119.96 / 1.43$

$\text{Distance} = 83.89 \text{ m}$

Answer: 83.89 m

Question 14

An observer looks at the top of a flagpole making an angle of elevation of 30° . Determine the length of the line of sight if the horizontal distance is 23 m.



Solution:

Using:

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

$\cos 30^\circ = 23 / \text{Hypotenuse}$

$0.87 = 23 / \text{Hypotenuse}$

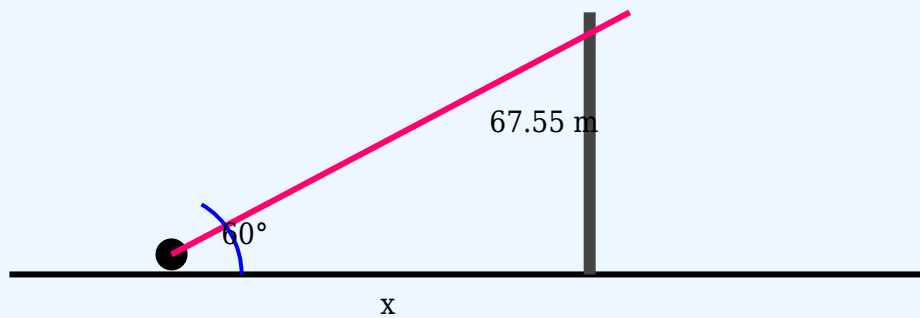
$\text{Hypotenuse} = 23 / 0.87$

$\text{Hypotenuse} = 26.44 \text{ m}$

Answer: 26.44 m

Question 15

A traveller observes the top of a crane at an angle of elevation of 60° . If the height of the crane is 67.55 m, find the horizontal distance.



Solution:

Using:

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

$\tan 60^\circ = 67.55 / \text{Distance}$

$1.73 = 67.55 / \text{Distance}$

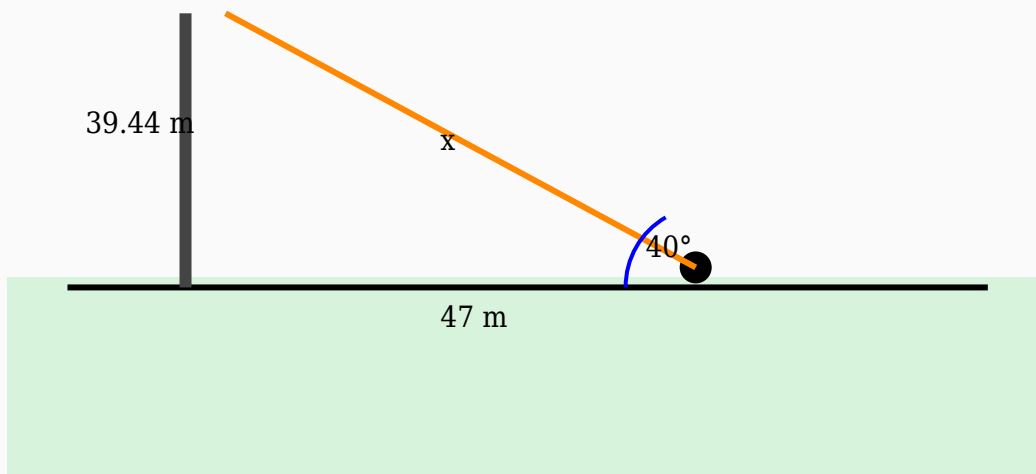
$\text{Distance} = 67.55 / 1.73$

$\text{Distance} = 39.05 \text{ m}$

Answer: 39.05 m

Question 16

An observer looks at the top of a bridge making an angle of elevation of 40° . Determine the length of the line of sight if the horizontal distance is 47 m.



Solution:

Using:

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

$$\cos 40^\circ = 47 / \text{Hypotenuse}$$

$$0.77 = 47 / \text{Hypotenuse}$$

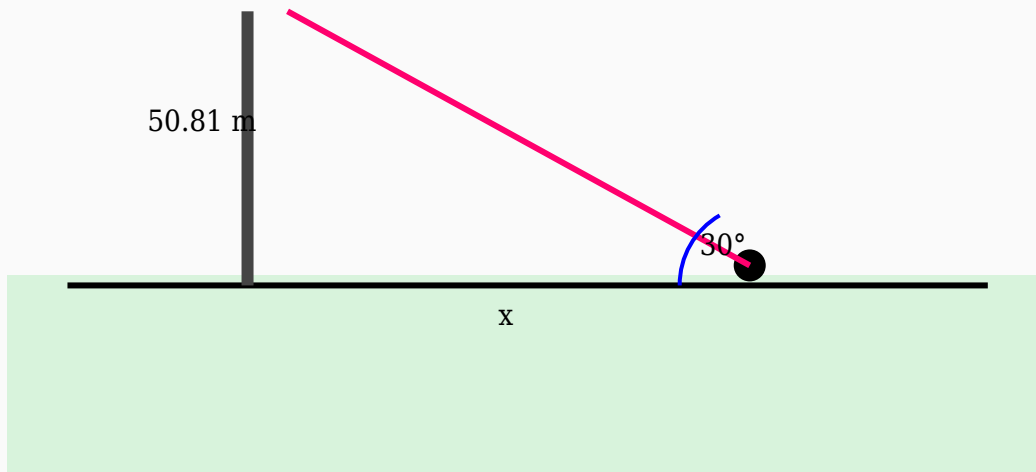
$$\text{Hypotenuse} = 47 / 0.77$$

$$\text{Hypotenuse} = 61.04 \text{ m}$$

Answer: 61.04 m

Question 17

The angle of elevation to the top of a building is 30° . Find the distance from the observer to the base if the height is 50.81 m.



Solution:

Using:

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

$\tan 30^\circ = 50.81 / \text{Distance}$

$0.58 = 50.81 / \text{Distance}$

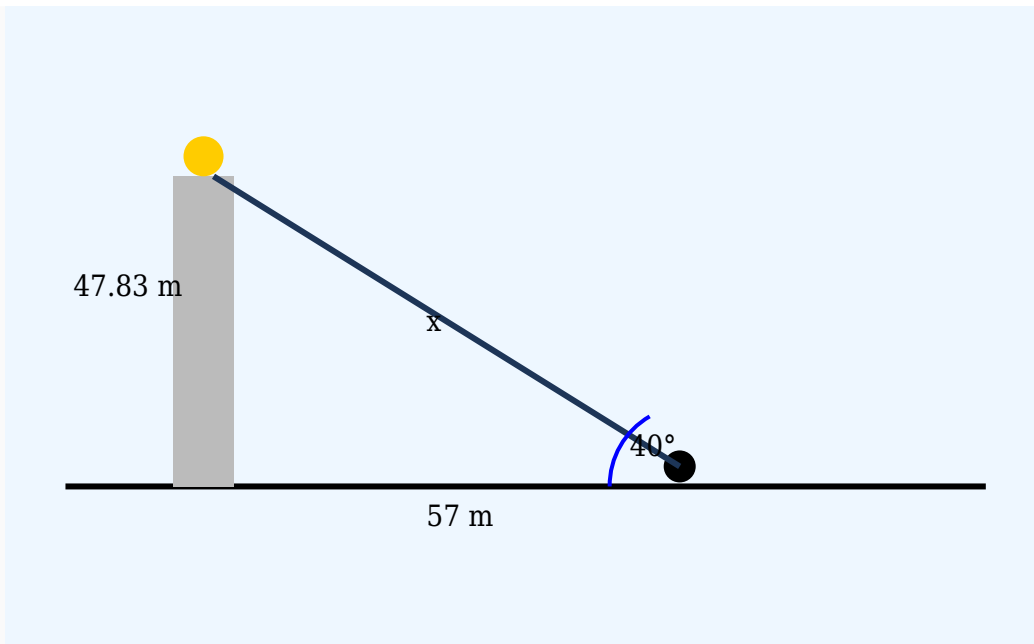
$\text{Distance} = 50.81 / 0.58$

$\text{Distance} = 87.6 \text{ m}$

Answer: 87.6 m

Question 18

An observer looks at the top of a water tank making an angle of elevation of 40° . Determine the length of the line of sight if the horizontal distance is 57 m.



Solution:

Using:

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

$\cos 40^\circ = 57 / \text{Hypotenuse}$

$0.77 = 57 / \text{Hypotenuse}$

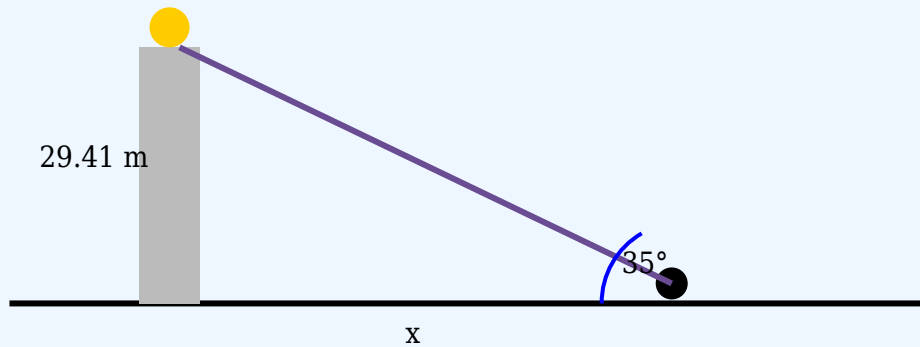
$\text{Hypotenuse} = 57 / 0.77$

$\text{Hypotenuse} = 74.03 \text{ m}$

Answer: 74.03 m

Question 19

The height of a mountain is 29.41 m. If the angle of elevation from a point on the ground is 35° , calculate the horizontal distance.



Solution:

Using:

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

$\tan 35^\circ = 29.41 / \text{Distance}$

$0.7 = 29.41 / \text{Distance}$

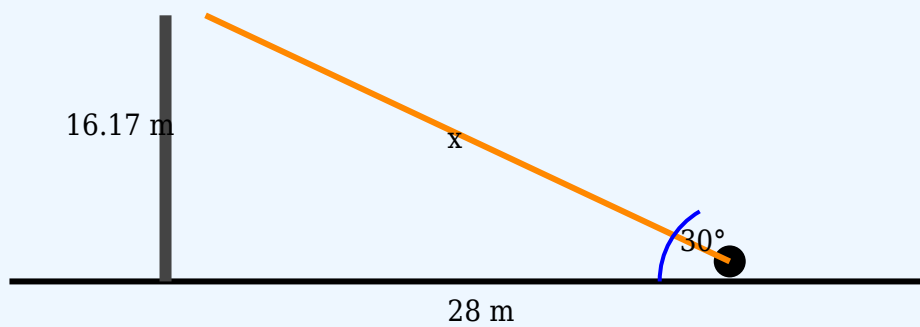
$\text{Distance} = 29.41 / 0.7$

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

Answer: 42.01 m

Question 20

A girl 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