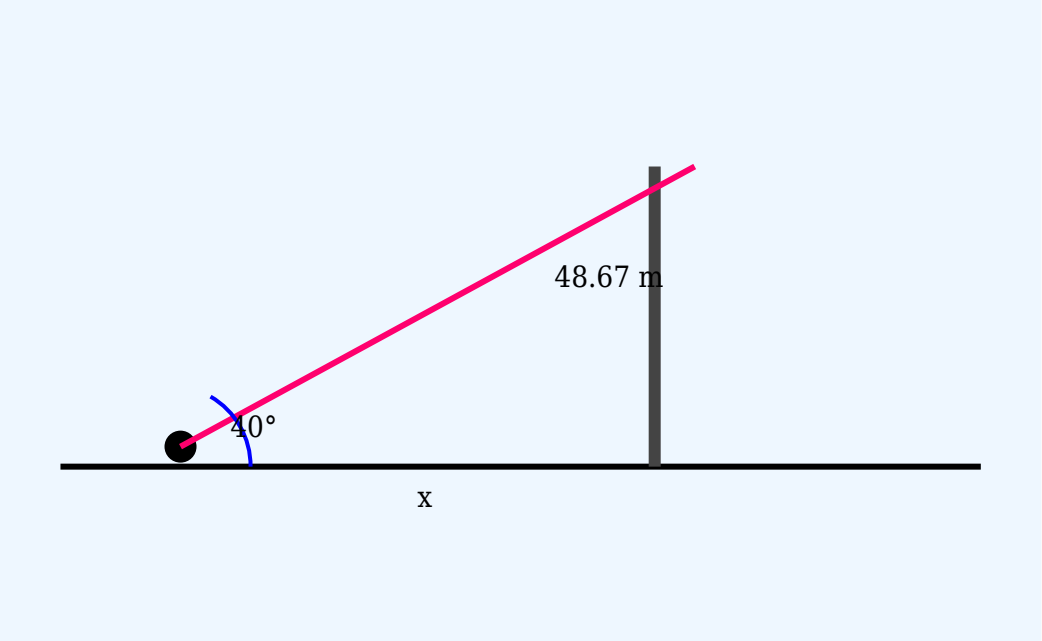
Angle of Elevation Solved Worksheet

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 θ = Opposite / Adjacent

tan 40° = 48.67 / Distance

0.84 = 48.67 / Distance

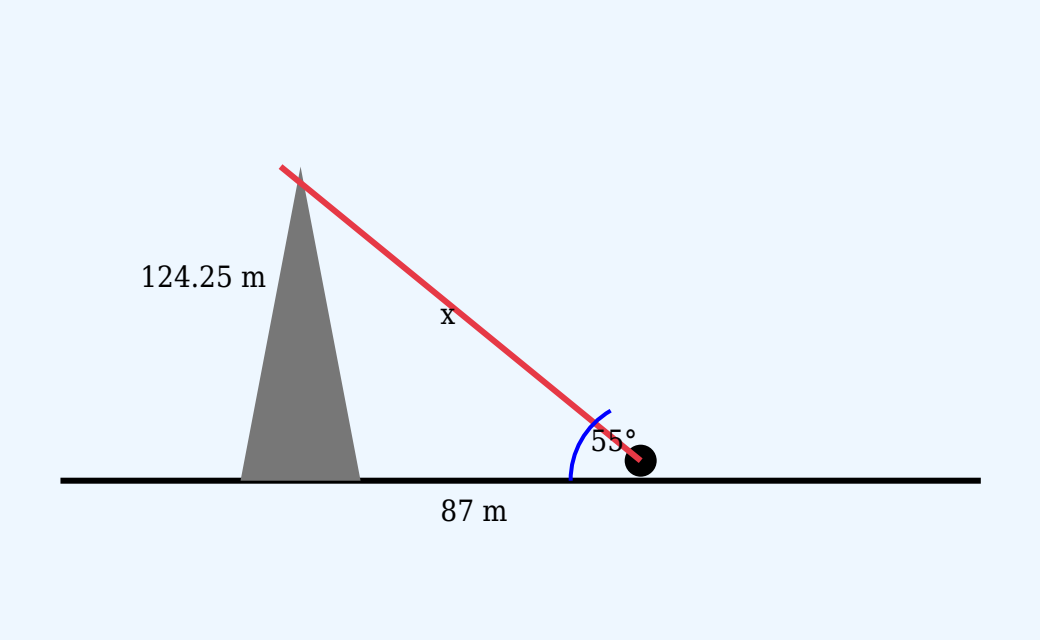
Distance = 48.67 / 0.84

Distance = 57.94 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 θ = Adjacent / Hypotenuse

cos 55° = 87 / Hypotenuse

0.57 = 87 / Hypotenuse

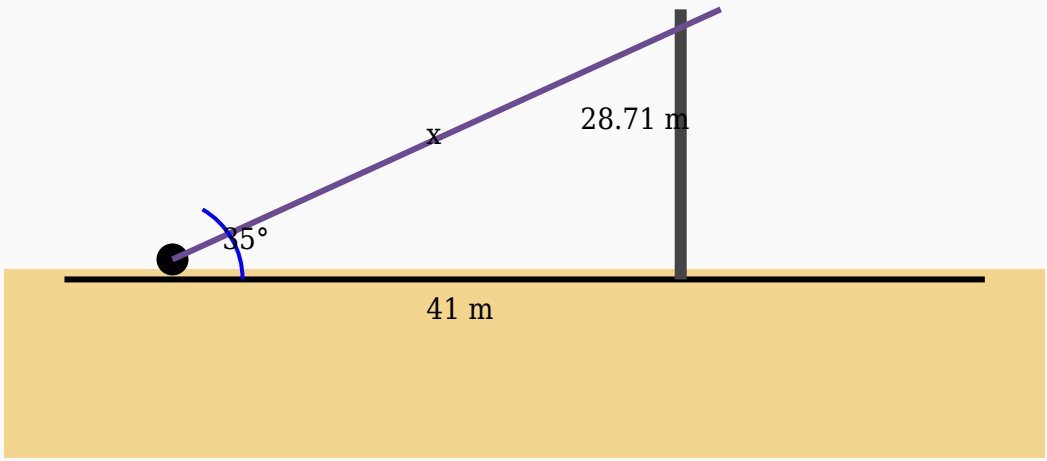
Hypotenuse = 87 / 0.57

Hypotenuse = 152.63 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 θ = Adjacent / Hypotenuse

cos 35° = 41 / Hypotenuse

0.82 = 41 / Hypotenuse

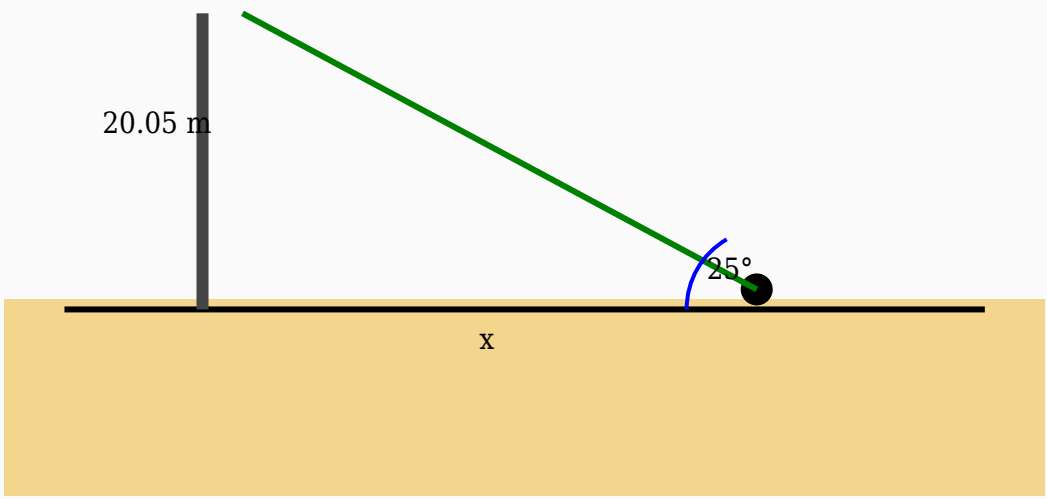
Hypotenuse = 41 / 0.82

Hypotenuse = 50 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 θ = Opposite / Adjacent

tan 25° = 20.05 / Distance

0.47 = 20.05 / Distance

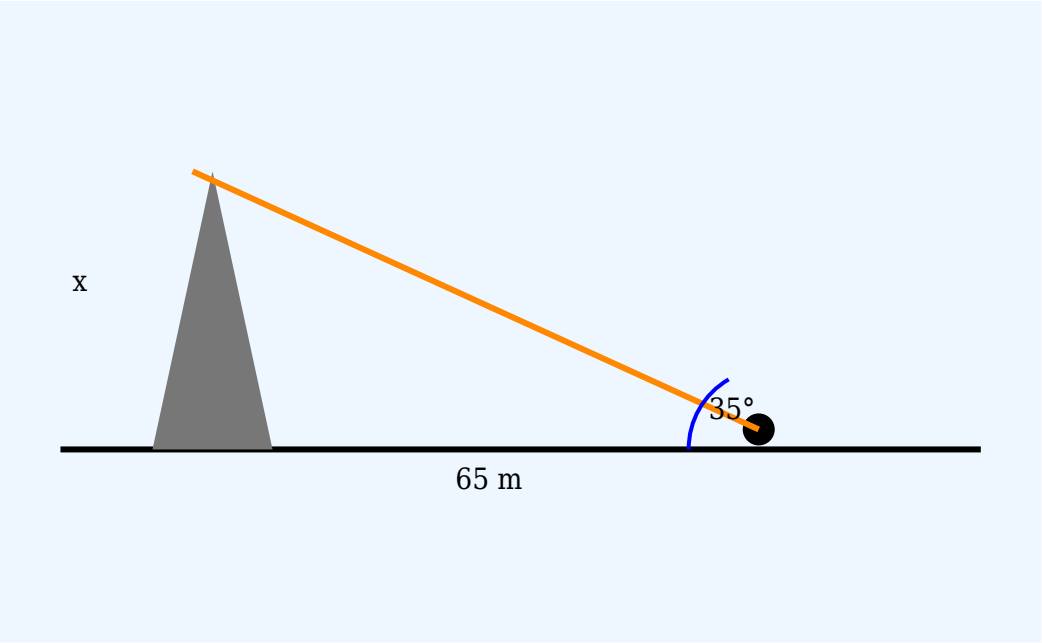
Distance = 20.05 / 0.47

Distance = 42.66 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 θ = Opposite / Adjacent

tan 35° = Height / 65

0.7 = Height / 65

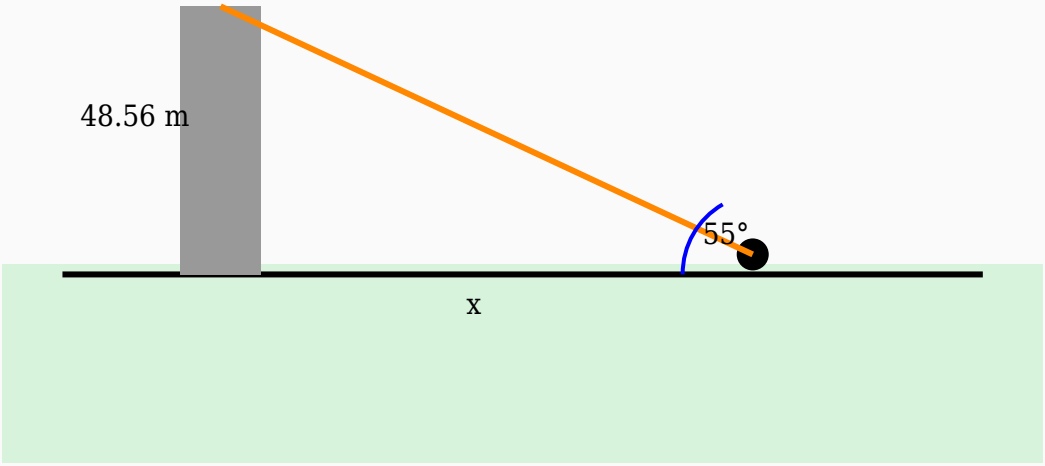
Height = 65 × 0.7

Height = 45.51 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 θ = Opposite / Adjacent

tan 55° = 48.56 / Distance

1.43 = 48.56 / Distance

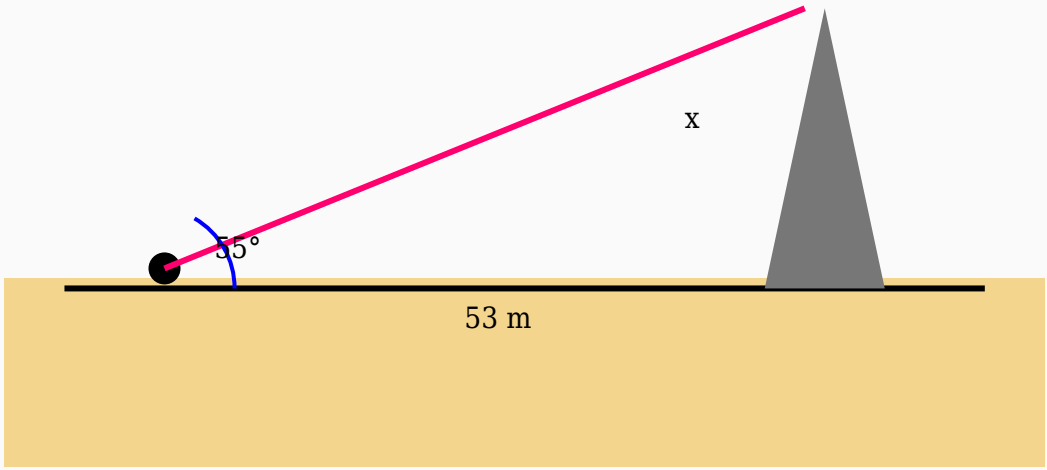
Distance = 48.56 / 1.43

Distance = 33.96 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 θ = Opposite / Adjacent

tan 55° = Height / 53

1.43 = Height / 53

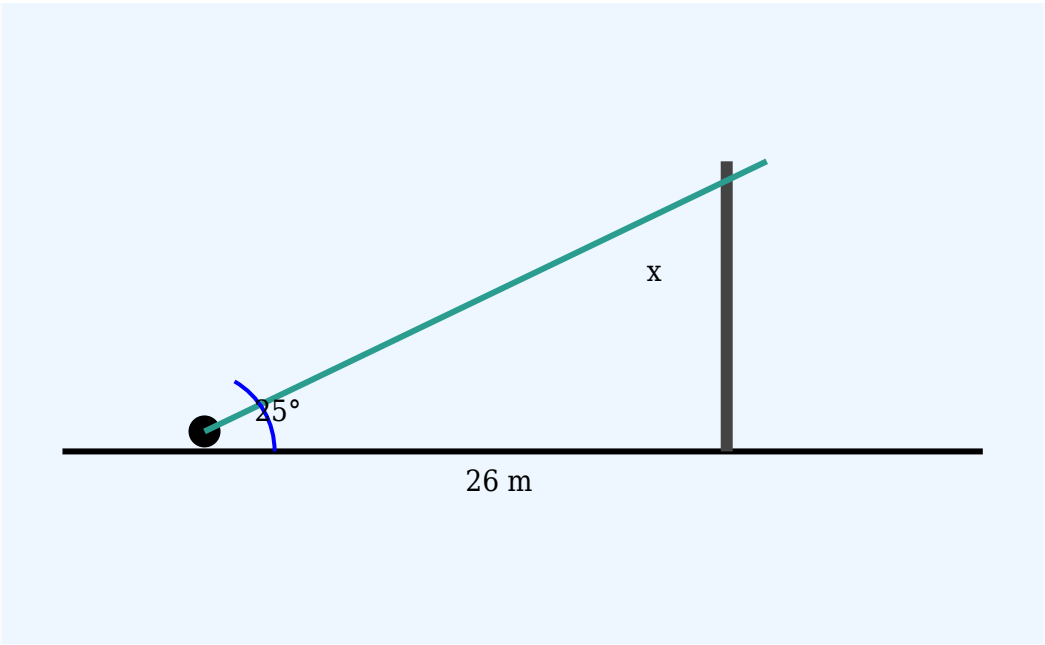
Height = 53 × 1.43

Height = 75.69 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 θ = Opposite / Adjacent

tan 25° = Height / 26

0.47 = Height / 26

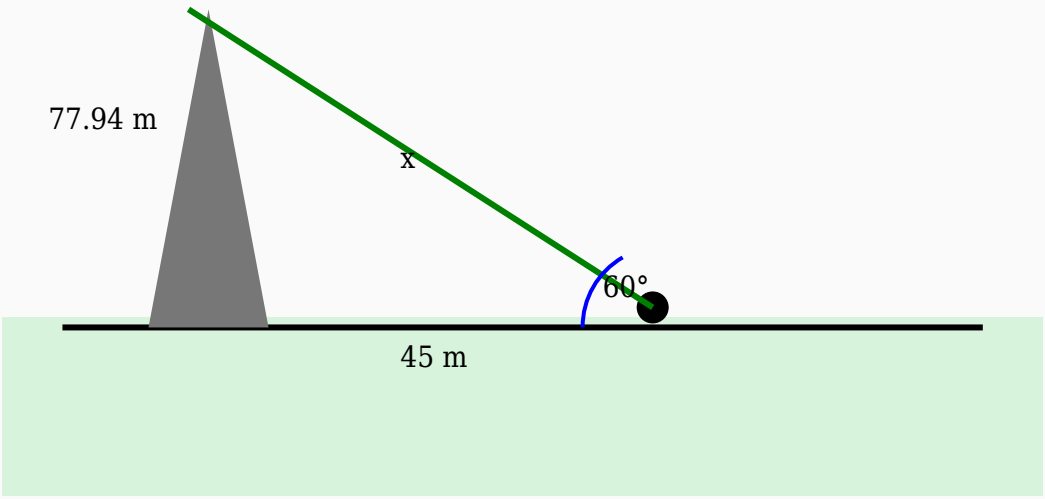
Height = 26 × 0.47

Height = 12.12 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 θ = Adjacent / Hypotenuse

cos 60° = 45 / Hypotenuse

0.5 = 45 / Hypotenuse

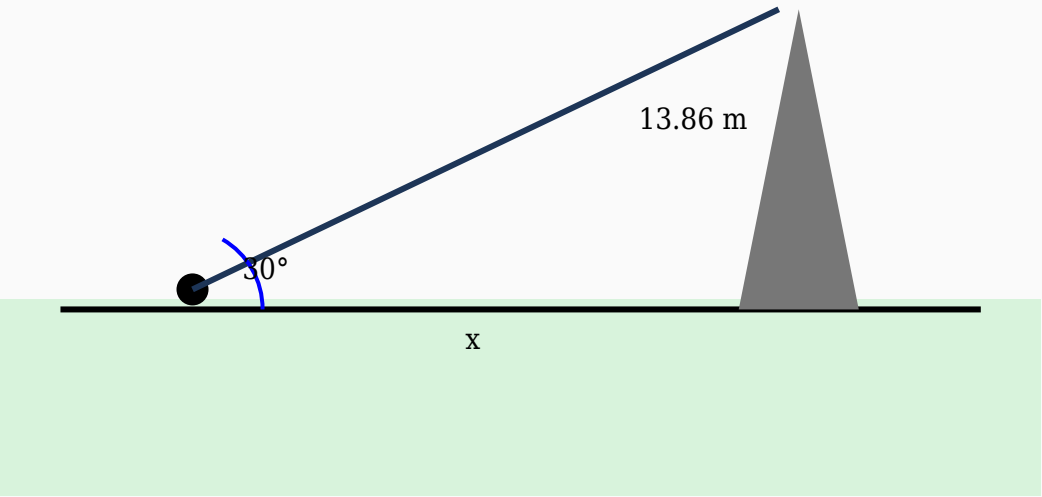
Hypotenuse = 45 / 0.5

Hypotenuse = 90 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 θ = Opposite / Adjacent

tan 30° = 13.86 / Distance

0.58 = 13.86 / Distance

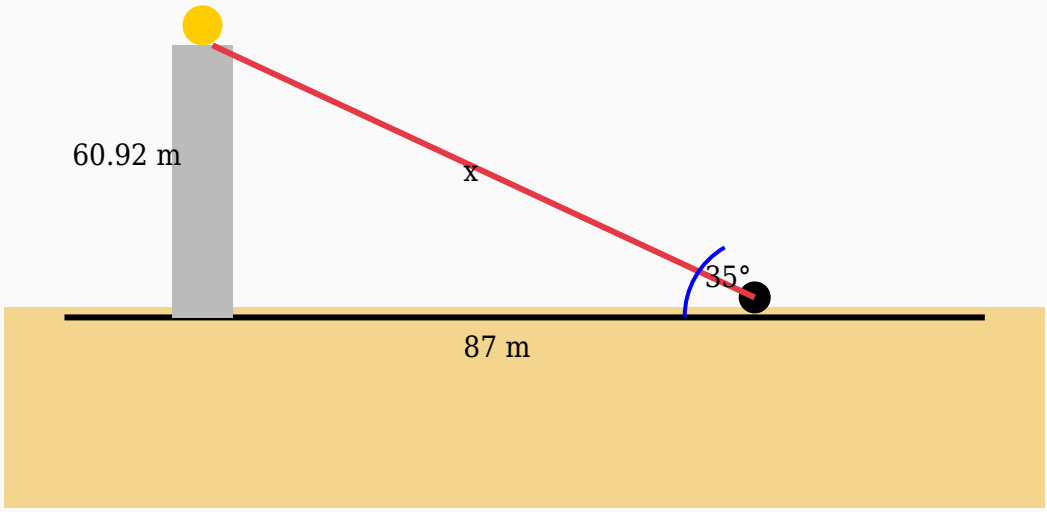
Distance = 13.86 / 0.58

Distance = 23.9 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 θ = Adjacent / Hypotenuse

cos 35° = 87 / Hypotenuse

0.82 = 87 / Hypotenuse

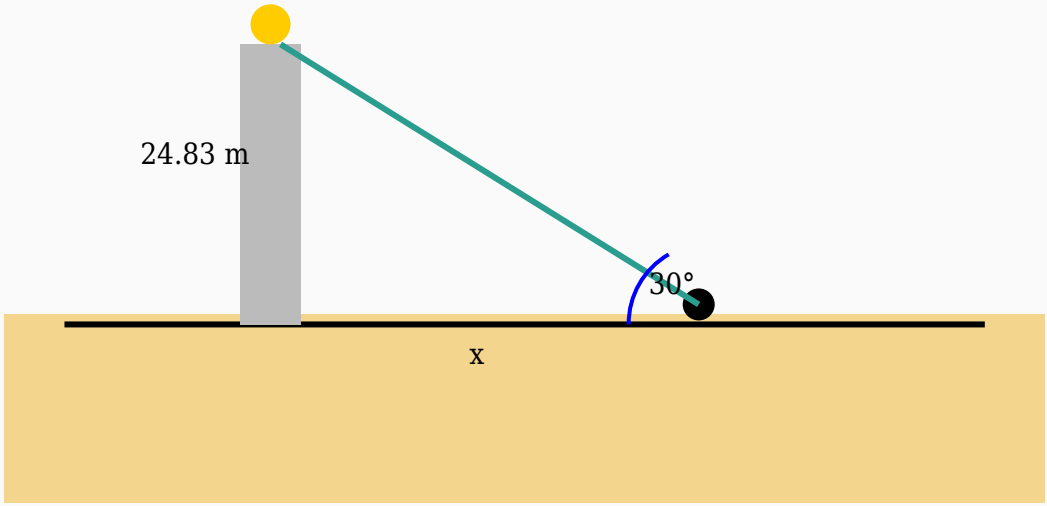
Hypotenuse = 87 / 0.82

Hypotenuse = 106.1 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 θ = Opposite / Adjacent

tan 30° = 24.83 / Distance

0.58 = 24.83 / Distance

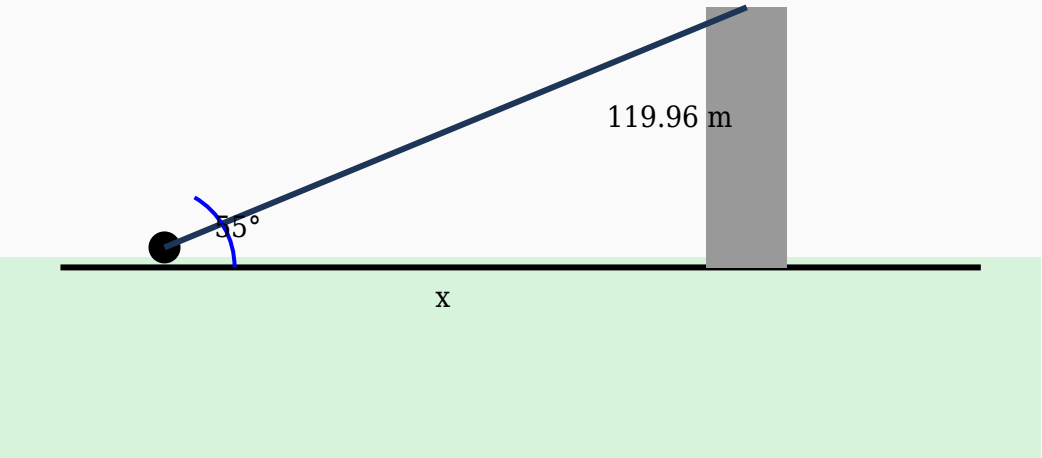
Distance = 24.83 / 0.58

Distance = 42.81 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 θ = Opposite / Adjacent

tan 55° = 119.96 / Distance

1.43 = 119.96 / Distance

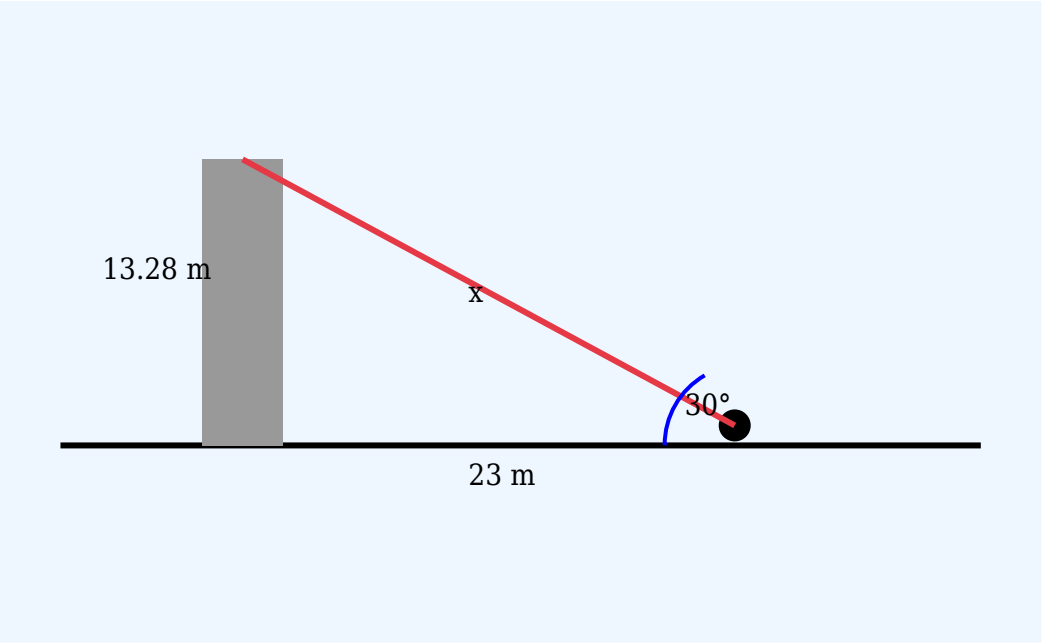
Distance = 119.96 / 1.43

Distance = 83.89 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 θ = Adjacent / Hypotenuse

cos 30° = 23 / Hypotenuse

0.87 = 23 / Hypotenuse

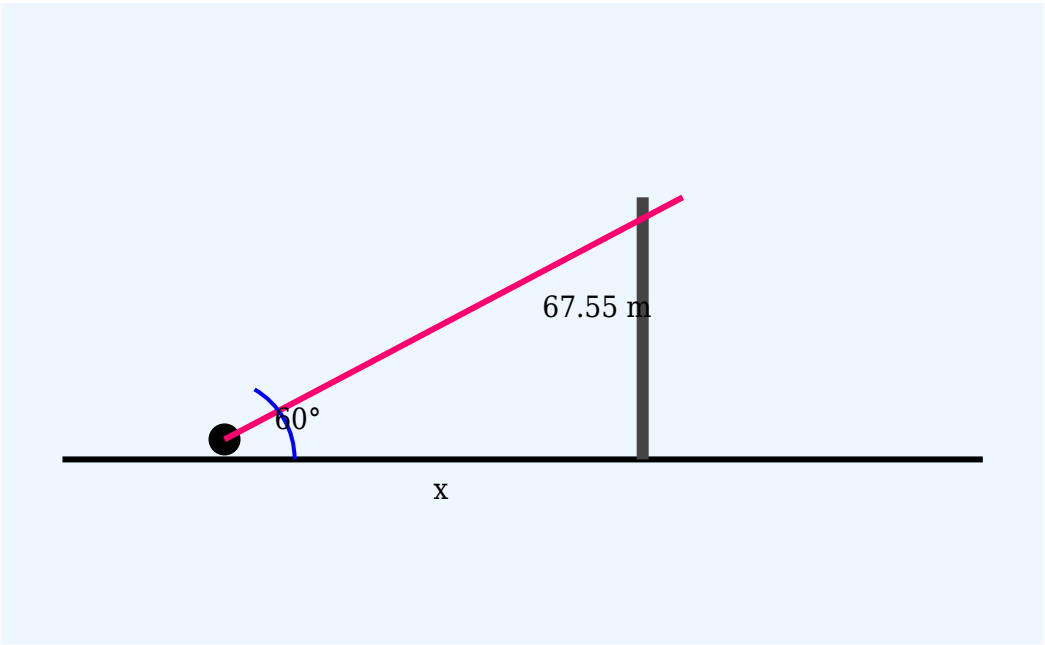
Hypotenuse = 23 / 0.87

Hypotenuse = 26.44 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 θ = Opposite / Adjacent

tan 60° = 67.55 / Distance

1.73 = 67.55 / Distance

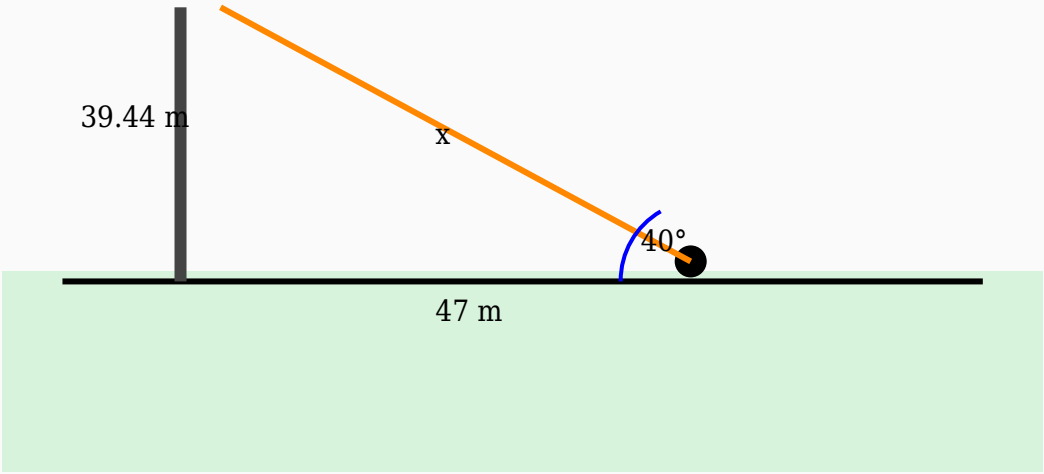
Distance = 67.55 / 1.73

Distance = 39.05 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 θ = Adjacent / Hypotenuse

cos 40° = 47 / Hypotenuse

0.77 = 47 / Hypotenuse

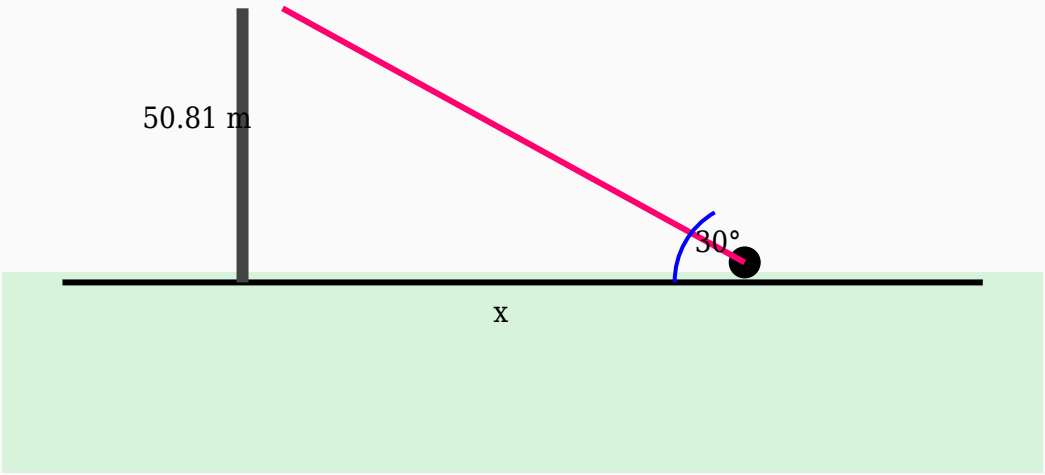
Hypotenuse = 47 / 0.77

Hypotenuse = 61.04 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 θ = Opposite / Adjacent

tan 30° = 50.81 / Distance

0.58 = 50.81 / Distance

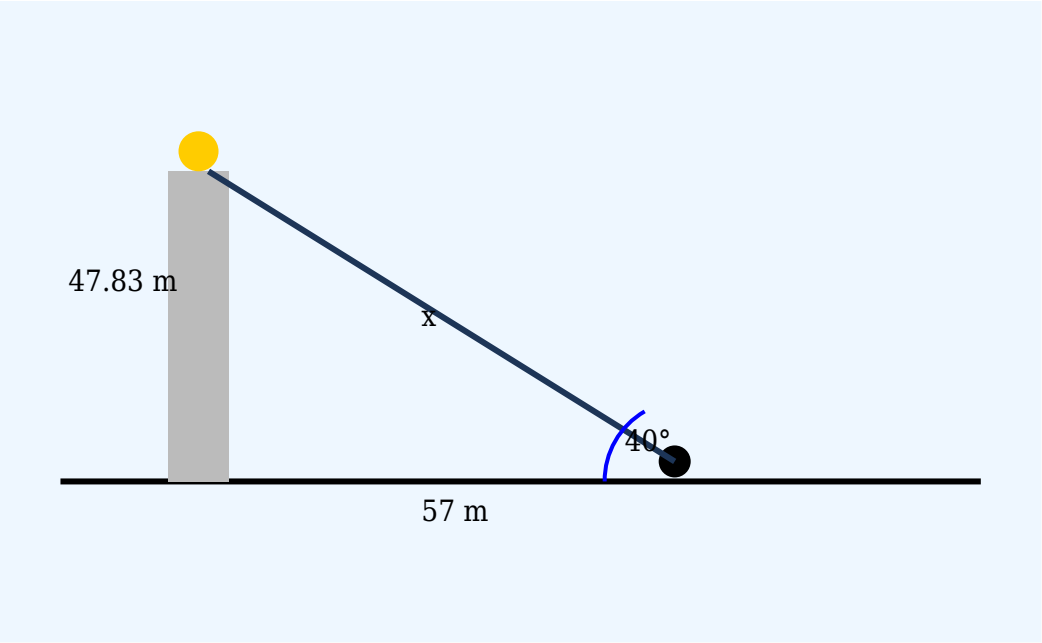
Distance = 50.81 / 0.58

Distance = 87.6 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 θ = Adjacent / Hypotenuse

cos 40° = 57 / Hypotenuse

0.77 = 57 / Hypotenuse

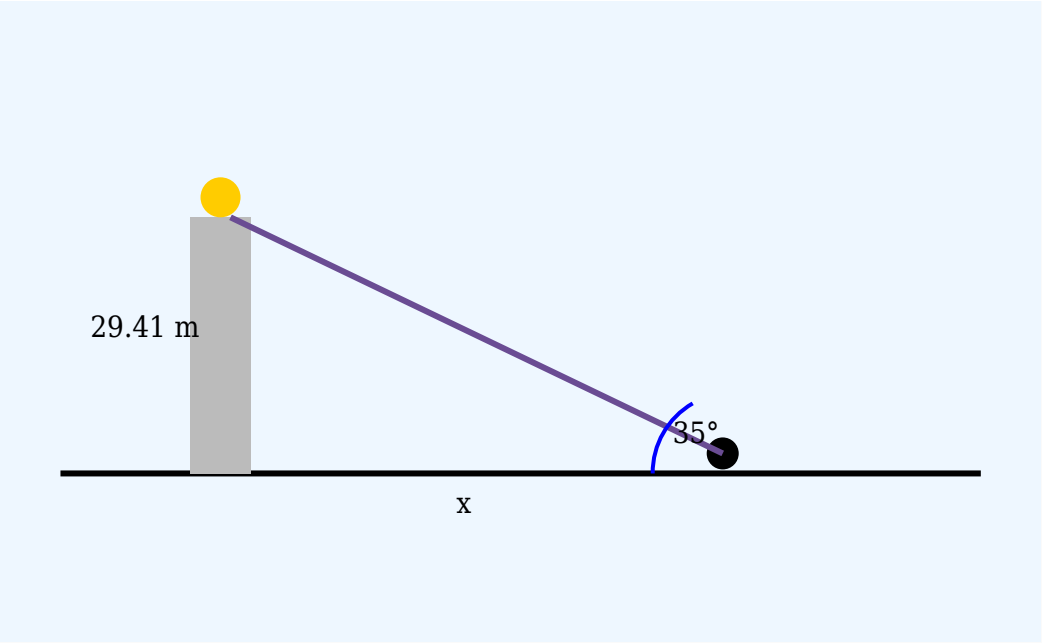
Hypotenuse = 57 / 0.77

Hypotenuse = 74.03 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 θ = Opposite / Adjacent

tan 35° = 29.41 / Distance

0.7 = 29.41 / Distance

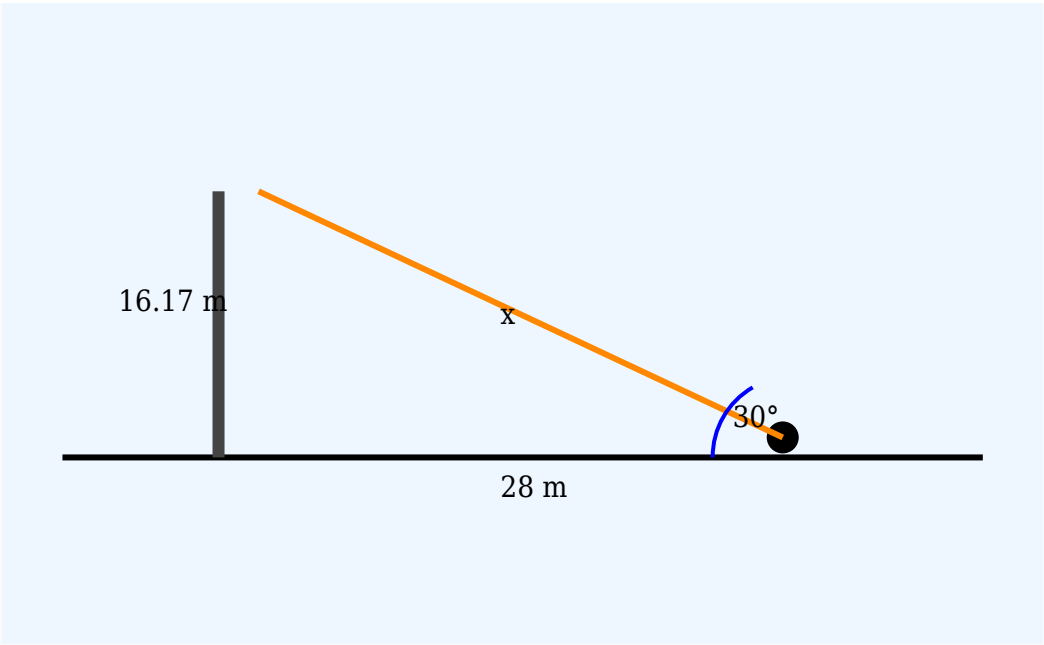
Distance = 29.41 / 0.7

Distance = 42.01 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 θ = Adjacent / Hypotenuse

cos 30° = 28 / Hypotenuse

0.87 = 28 / Hypotenuse

Hypotenuse = 28 / 0.87

Hypotenuse = 32.18 m

Answer: 32.18 m