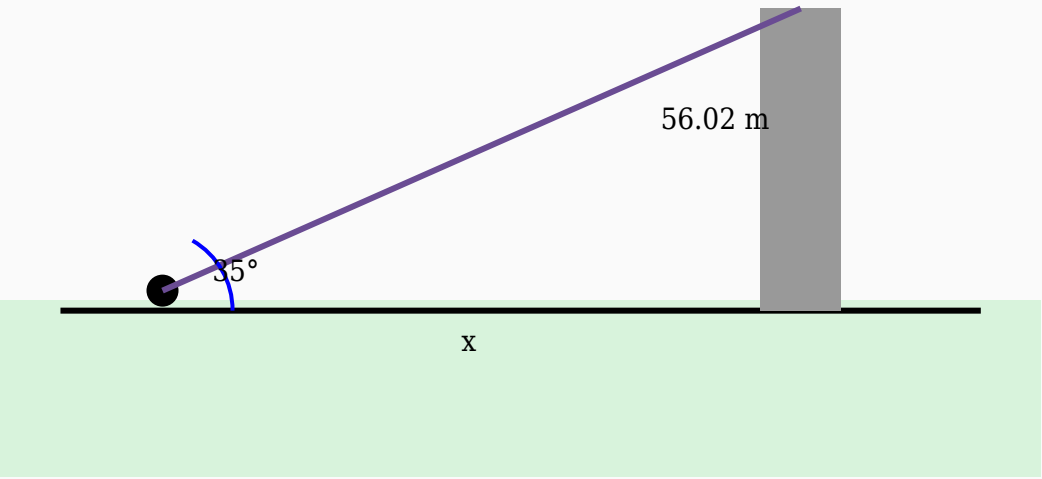
Angle of Elevation Solved Worksheet

Question 1

A surveyor notices the top of a tower at an angle of elevation of 35°. Determine the horizontal distance if the height of the tower is 56.02 m.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 35° = 56.02 / Distance

0.7 = 56.02 / Distance

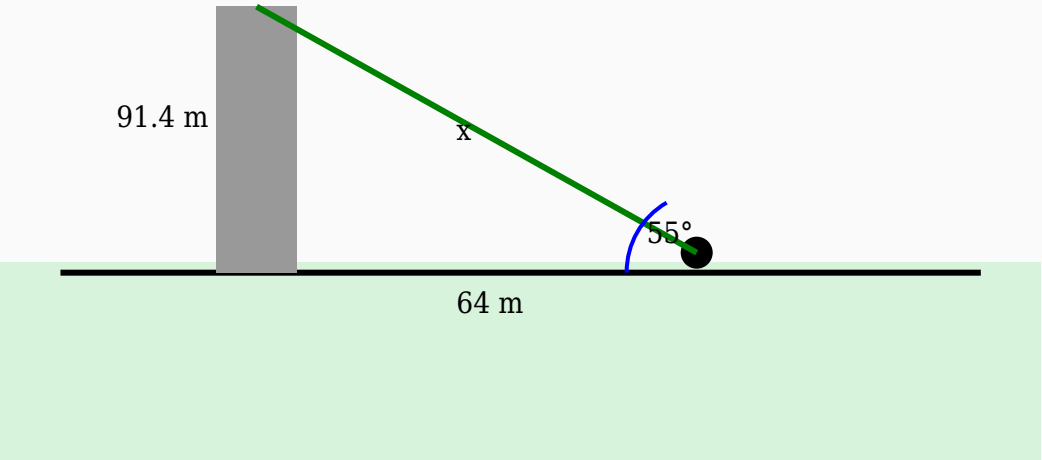
Distance = 56.02 / 0.7

Distance = 80.03 m

Answer: 80.03 m

Question 2

The angle of elevation to the top of a bridge is 55°. If the observer is 64 m from the base, calculate the hypotenuse.



Solution:

Using:
cos θ = Adjacent / Hypotenuse

cos 55° = 64 / Hypotenuse

0.57 = 64 / Hypotenuse

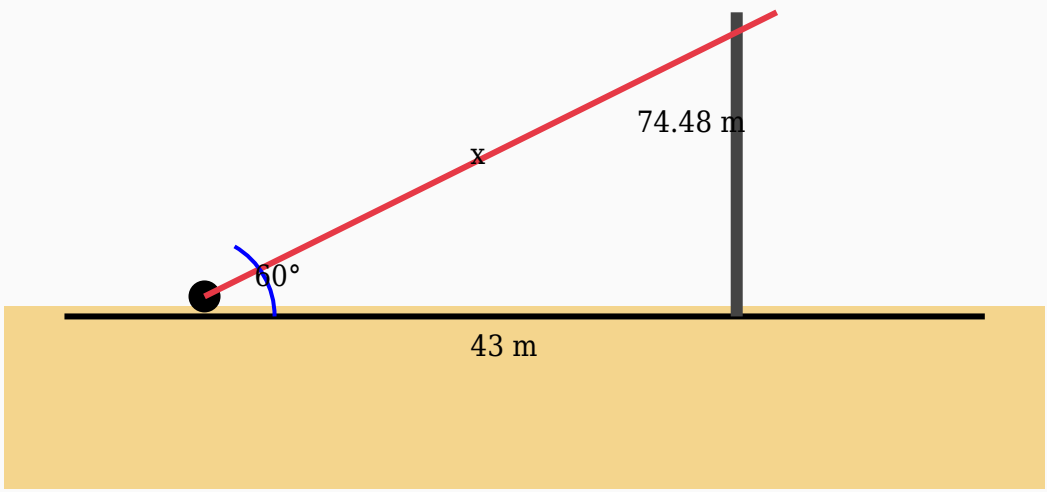
Hypotenuse = 64 / 0.57

Hypotenuse = 112.28 m

Answer: 112.28 m

Question 3

A traveller observes the top of a stadium light at an angle of elevation of 60°. If the horizontal distance is 43 m, find the line of sight distance.



Solution:

Using:
cos θ = Adjacent / Hypotenuse

cos 60° = 43 / Hypotenuse

0.5 = 43 / Hypotenuse

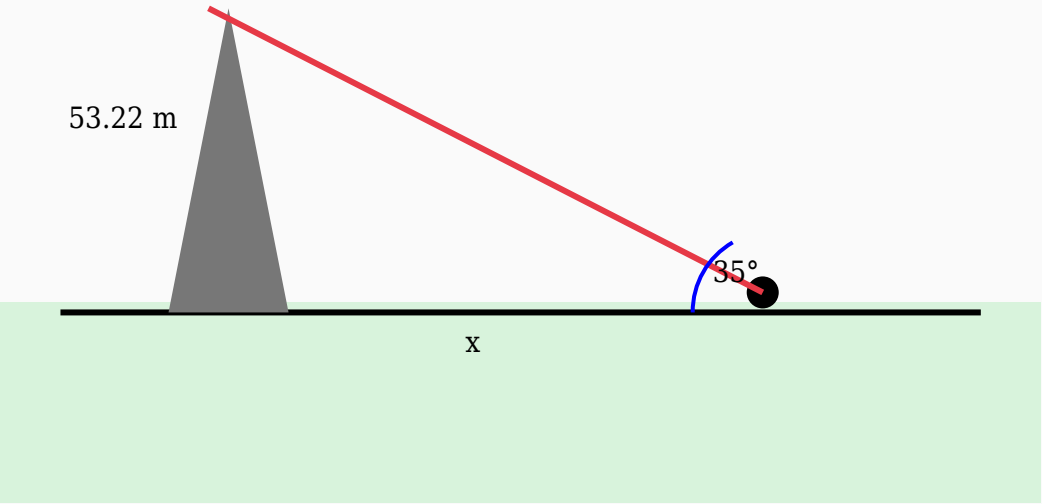
Hypotenuse = 43 / 0.5

Hypotenuse = 86 m

Answer: 86 m

Question 4

The angle of elevation to the top of a mountain is 35°. Find the distance from the observer to the base if the height is 53.22 m.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 35° = 53.22 / Distance

0.7 = 53.22 / Distance

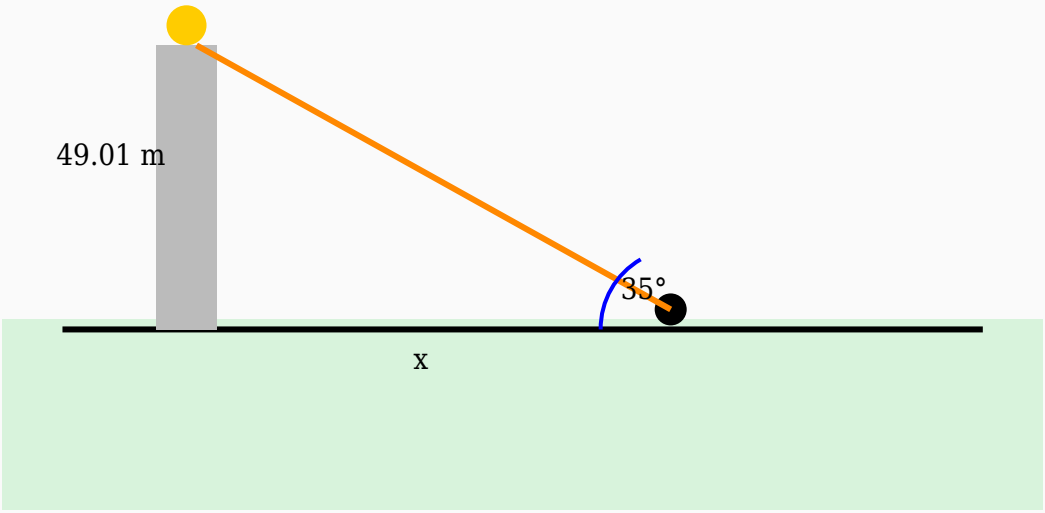
Distance = 53.22 / 0.7

Distance = 76.03 m

Answer: 76.03 m

Question 5

The height of a electric pole is 49.01 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° = 49.01 / Distance

0.7 = 49.01 / Distance

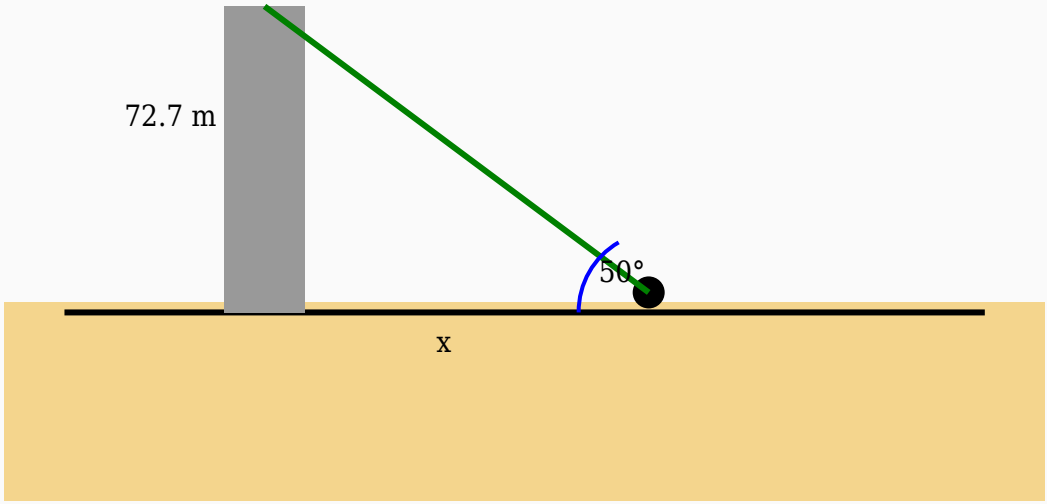
Distance = 49.01 / 0.7

Distance = 70.01 m

Answer: 70.01 m

Question 6

The height of a mountain is 72.7 m. If the angle of elevation from a point on the ground is 50°, calculate the horizontal distance.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 50° = 72.7 / Distance

1.19 = 72.7 / Distance

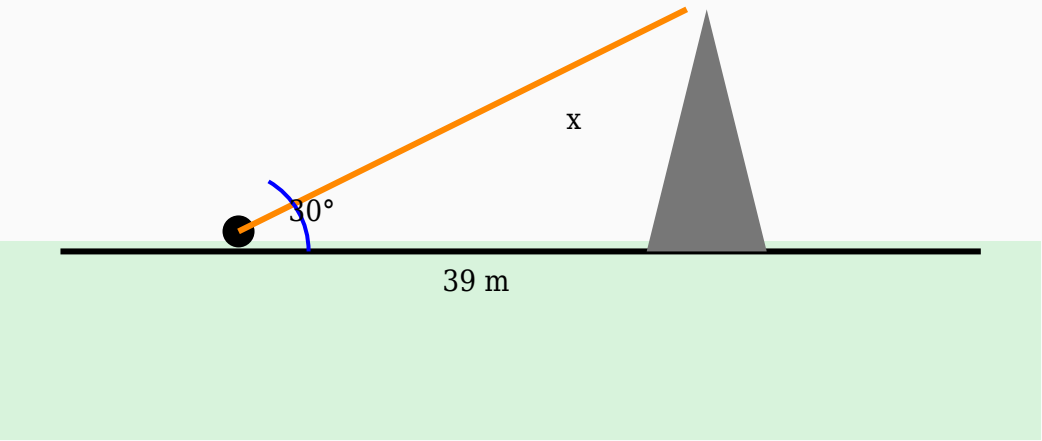
Distance = 72.7 / 1.19

Distance = 61.09 m

Answer: 61.09 m

Question 7

A girl standing near a hill observes its top at an angle of elevation of 30°. If the horizontal distance is 39 m, find the height of the hill.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 30° = Height / 39

0.58 = Height / 39

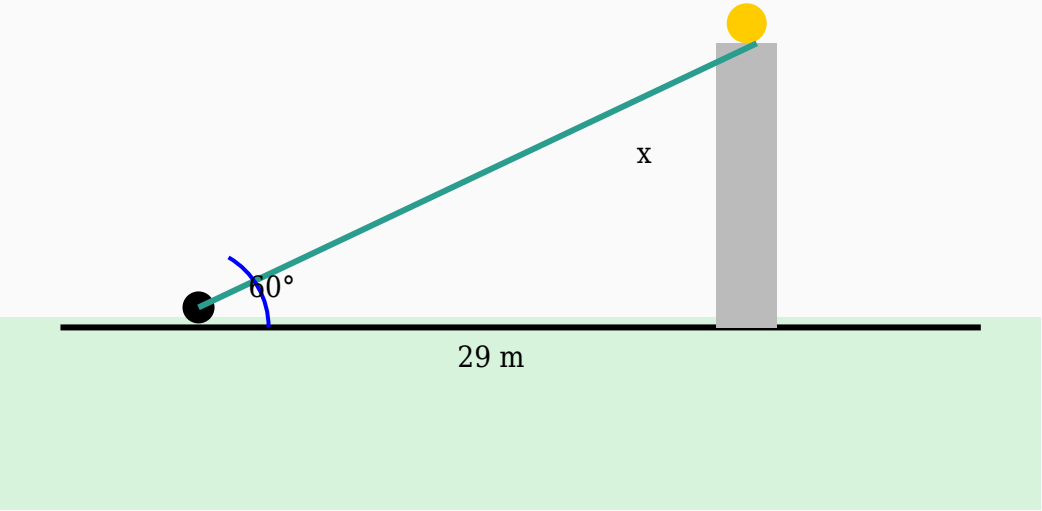
Height = 39 × 0.58

Height = 22.52 m

Answer: 22.52 m

Question 8

A person measures the angle of elevation to the top of a building as 60°. If the distance from the building is 29 m, determine its height.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 60° = Height / 29

1.73 = Height / 29

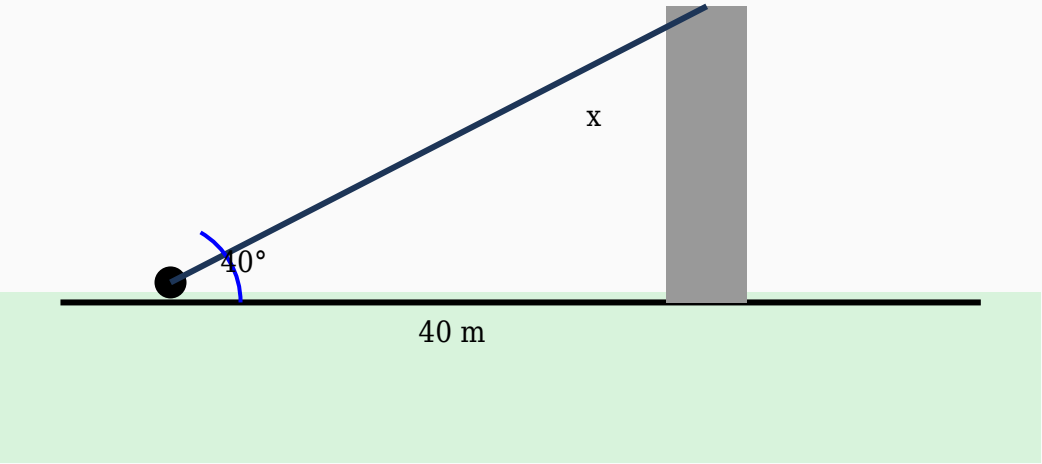
Height = 29 × 1.73

Height = 50.23 m

Answer: 50.23 m

Question 9

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



Solution:

Using:
tan θ = Opposite / Adjacent

tan 40° = Height / 40

0.84 = Height / 40

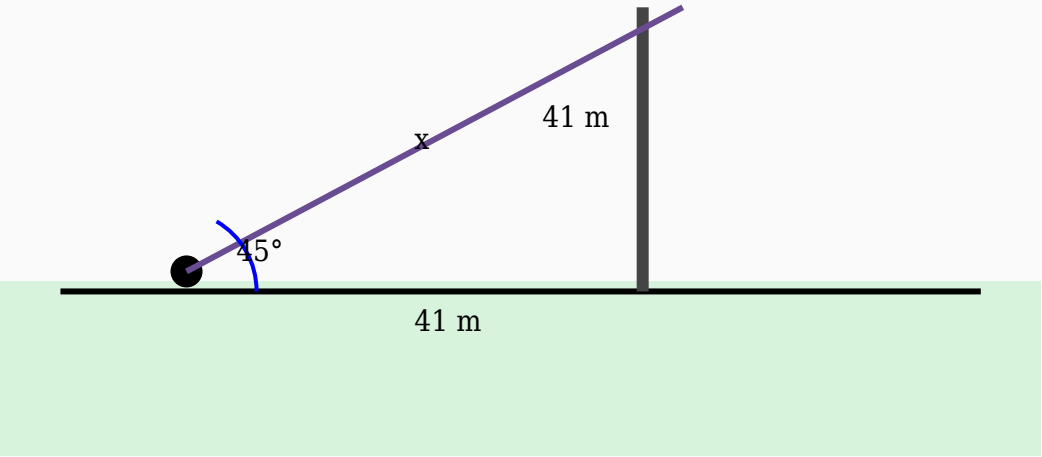
Height = 40 × 0.84

Height = 33.56 m

Answer: 33.56 m

Question 10

The angle of elevation to the top of a lighthouse is 45°. If the observer is 41 m from the base, calculate the hypotenuse.



Solution:

Using:
cos θ = Adjacent / Hypotenuse

cos 45° = 41 / Hypotenuse

0.71 = 41 / Hypotenuse

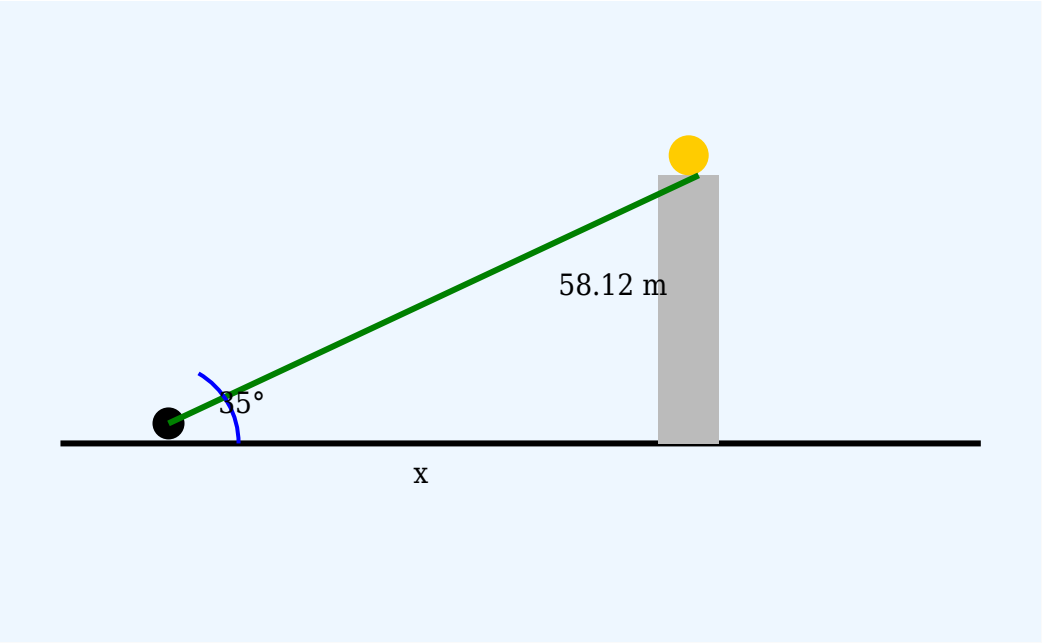
Hypotenuse = 41 / 0.71

Hypotenuse = 57.75 m

Answer: 57.75 m

Question 11

The angle of elevation to the top of a lighthouse is 35°. Find the distance from the observer to the base if the height is 58.12 m.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 35° = 58.12 / Distance

0.7 = 58.12 / Distance

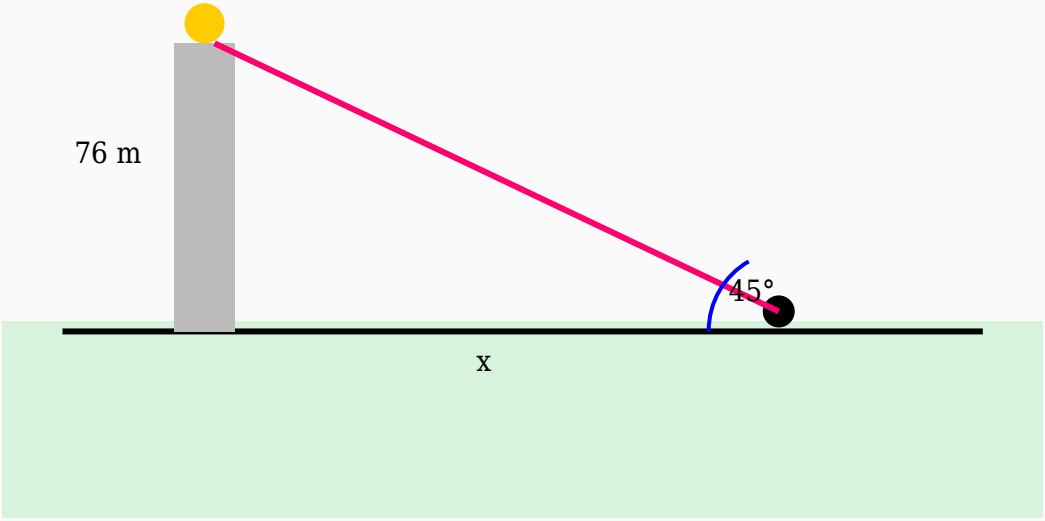
Distance = 58.12 / 0.7

Distance = 83.03 m

Answer: 83.03 m

Question 12

A woman observes the top of a water tank at an angle of elevation of 45°. If the height of the water tank is 76 m, find the horizontal distance.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 45° = 76 / Distance

1 = 76 / Distance

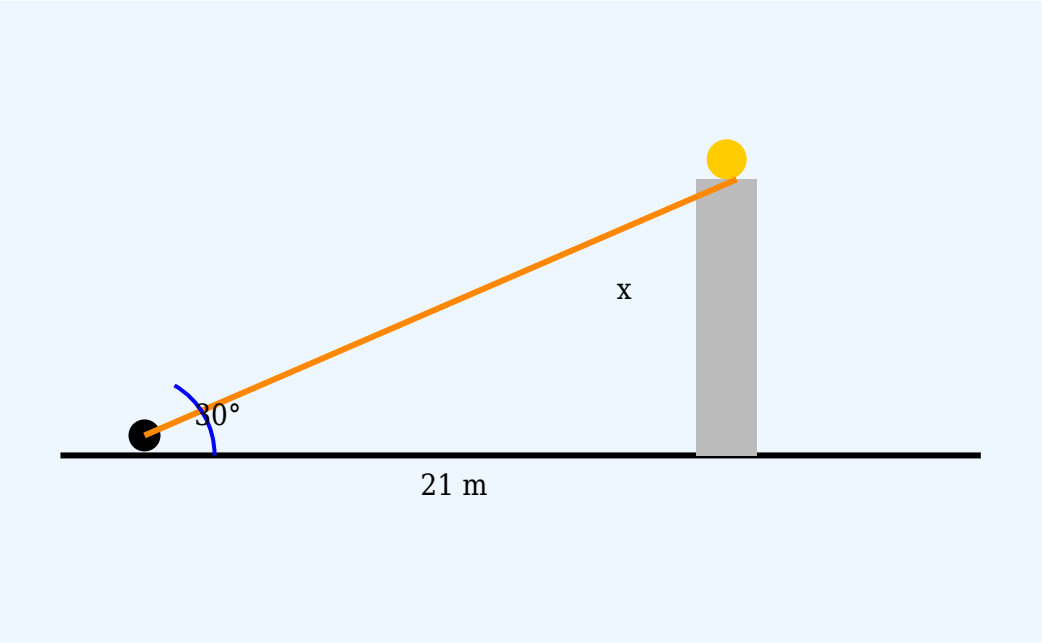
Distance = 76 / 1

Distance = 76 m

Answer: 76 m

Question 13

A person measures the angle of elevation to the top of a stadium light as 30°. If the distance from the stadium light is 21 m, determine its height.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 30° = Height / 21

0.58 = Height / 21

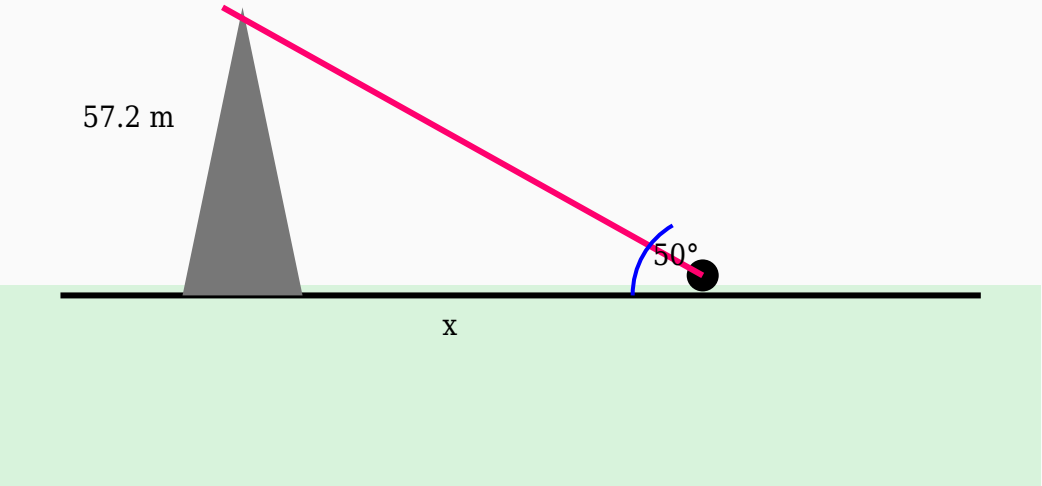
Height = 21 × 0.58

Height = 12.12 m

Answer: 12.12 m

Question 14

The height of a mountain is 57.2 m. If the angle of elevation from a point on the ground is 50°, calculate the horizontal distance.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 50° = 57.2 / Distance

1.19 = 57.2 / Distance

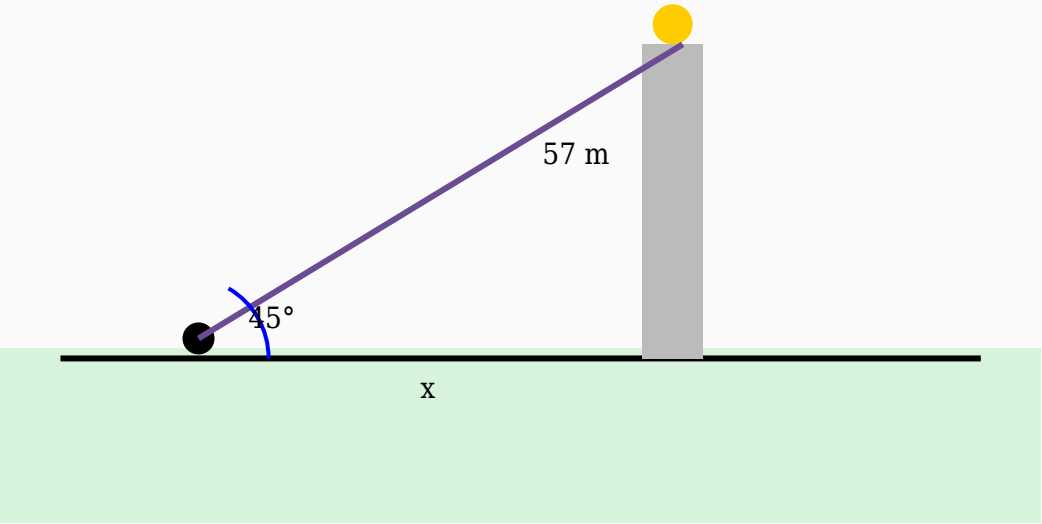
Distance = 57.2 / 1.19

Distance = 48.07 m

Answer: 48.07 m

Question 15

A photographer observes the top of a tower at an angle of elevation of 45°. If the height of the tower is 57 m, find the horizontal distance.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 45° = 57 / Distance

1 = 57 / Distance

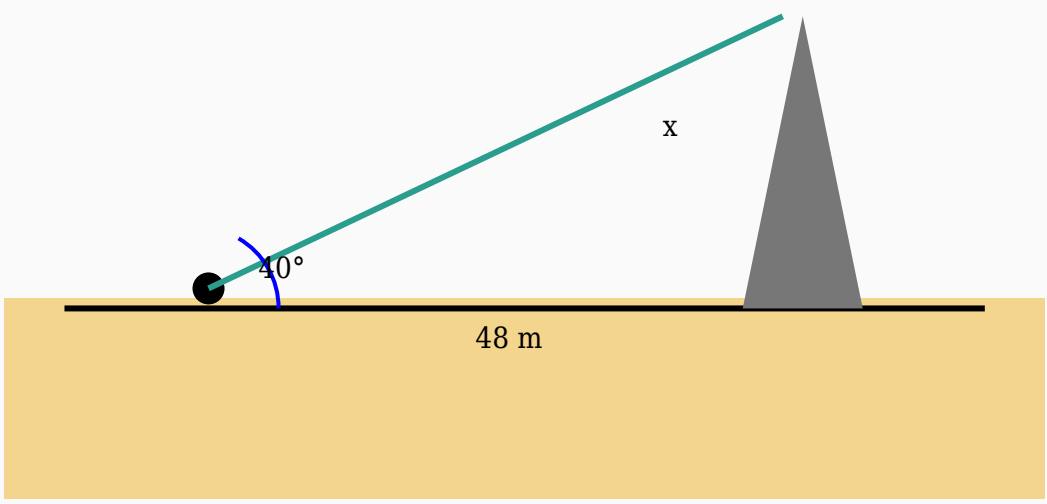
Distance = 57 / 1

Distance = 57 m

Answer: 57 m

Question 16

A person measures the angle of elevation to the top of a tree as 40°. If the distance from the tree is 48 m, determine its height.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 40° = Height / 48

0.84 = Height / 48

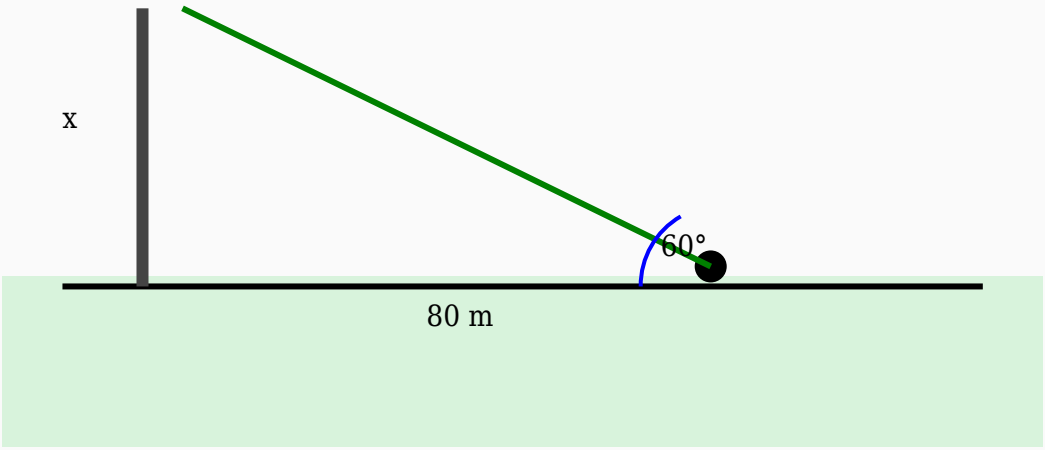
Height = 48 × 0.84

Height = 40.28 m

Answer: 40.28 m

Question 17

A tourist standing near a lighthouse observes its top at an angle of elevation of 60°. If the horizontal distance is 80 m, find the height of the lighthouse.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 60° = Height / 80

1.73 = Height / 80

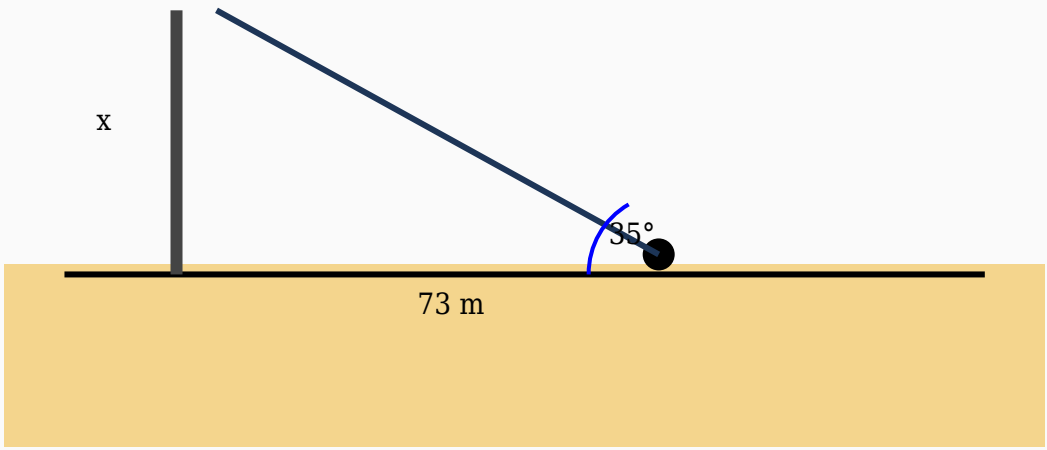
Height = 80 × 1.73

Height = 138.56 m

Answer: 138.56 m

Question 18

A person measures the angle of elevation to the top of a tree as 35°. If the distance from the tree is 73 m, determine its height.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 35° = Height / 73

0.7 = Height / 73

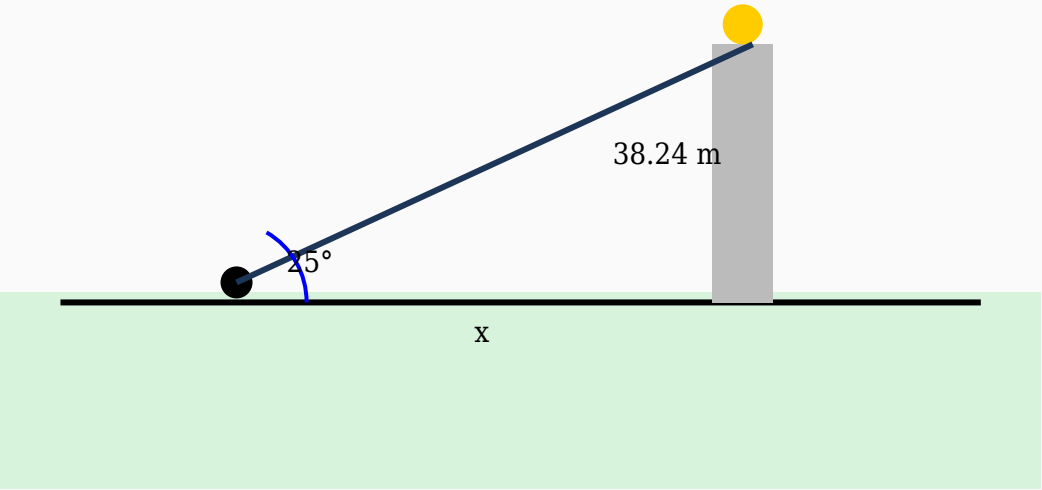
Height = 73 × 0.7

Height = 51.12 m

Answer: 51.12 m

Question 19

The height of a crane is 38.24 m. If the angle of elevation from a point on the ground is 25°, calculate the horizontal distance.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 25° = 38.24 / Distance

0.47 = 38.24 / Distance

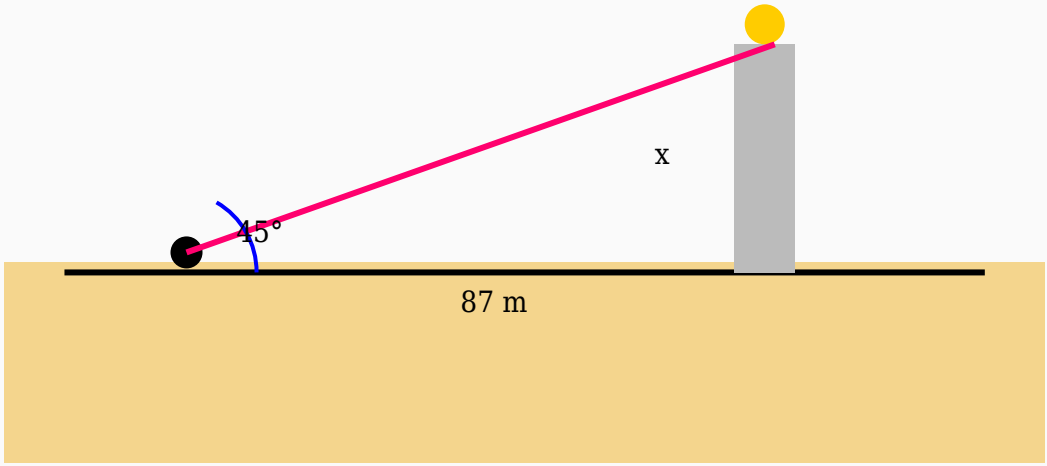
Distance = 38.24 / 0.47

Distance = 81.36 m

Answer: 81.36 m

Question 20

A person measures the angle of elevation to the top of a hill as 45°. If the distance from the hill is 87 m, determine its height.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 45° = Height / 87

1 = Height / 87

Height = 87 × 1

Height = 87 m

Answer: 87 m