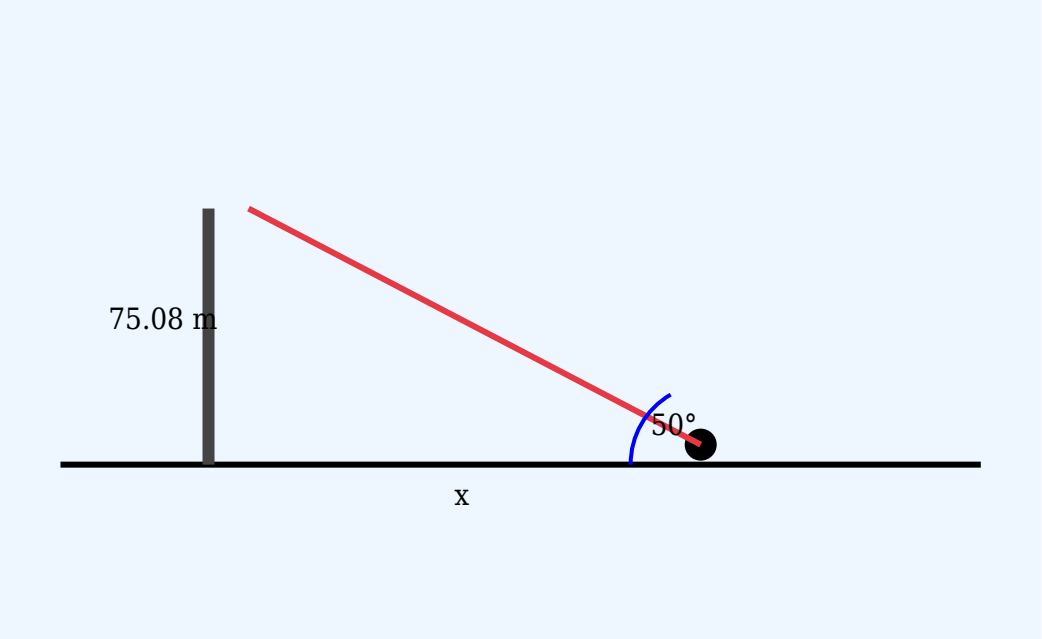
Angle of Elevation Solved Worksheet

Question 1

A surveyor notices the top of a building at an angle of elevation of 50°. Determine the horizontal distance if the height of the building is 75.08 m.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 50° = 75.08 / Distance

1.19 = 75.08 / Distance

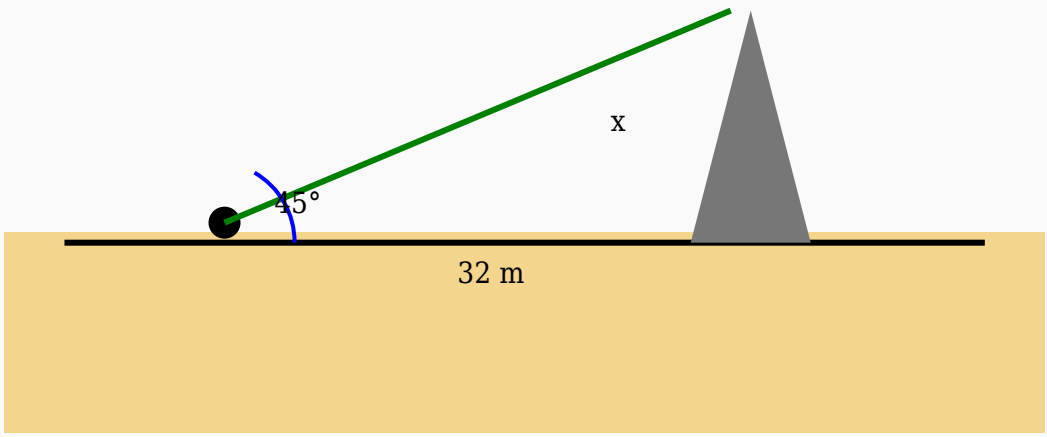
Distance = 75.08 / 1.19

Distance = 63.09 m

Answer: 63.09 m

Question 2

A girl looks at the top of a lighthouse at an angle of elevation of 45°. Find the height of the lighthouse if the distance from the base is 32 m.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 45° = Height / 32

1 = Height / 32

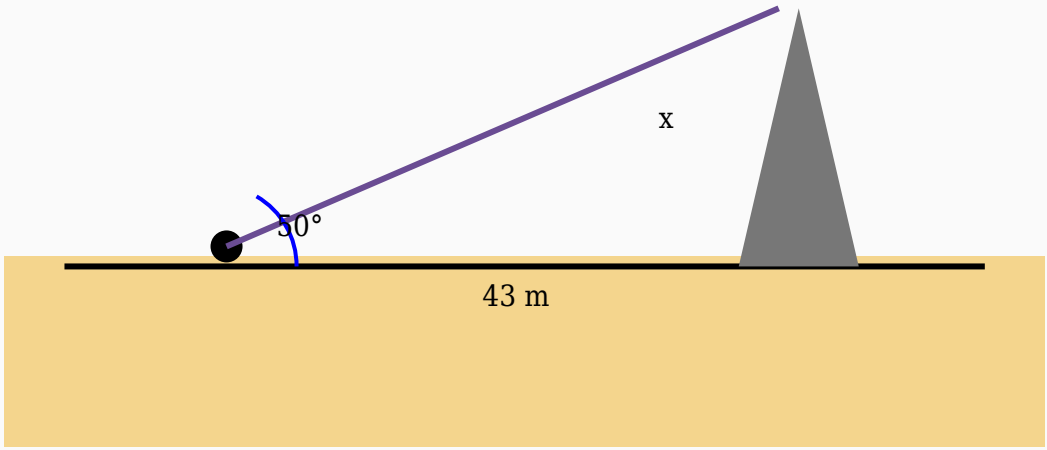
Height = 32 × 1

Height = 32 m

Answer: 32 m

Question 3

The angle of elevation of the top of a lighthouse from a point on the ground is 50°. If the observer is 43 m away from the lighthouse, calculate its height.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 50° = Height / 43

1.19 = Height / 43

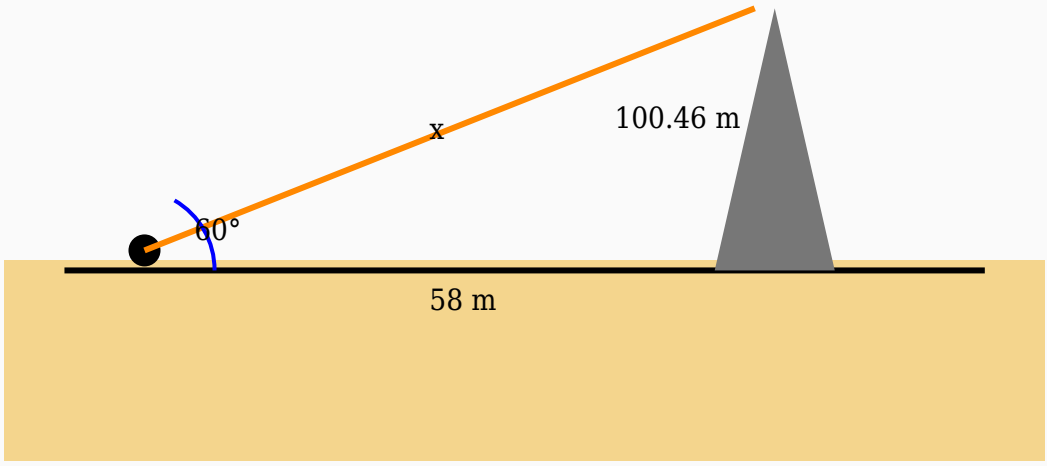
Height = 43 × 1.19

Height = 51.25 m

Answer: 51.25 m

Question 4

A boy observes the top of a mountain at an angle of elevation of 60°. If the horizontal distance is 58 m, find the line of sight distance.



Solution:

Using:
cos θ = Adjacent / Hypotenuse

cos 60° = 58 / Hypotenuse

0.5 = 58 / Hypotenuse

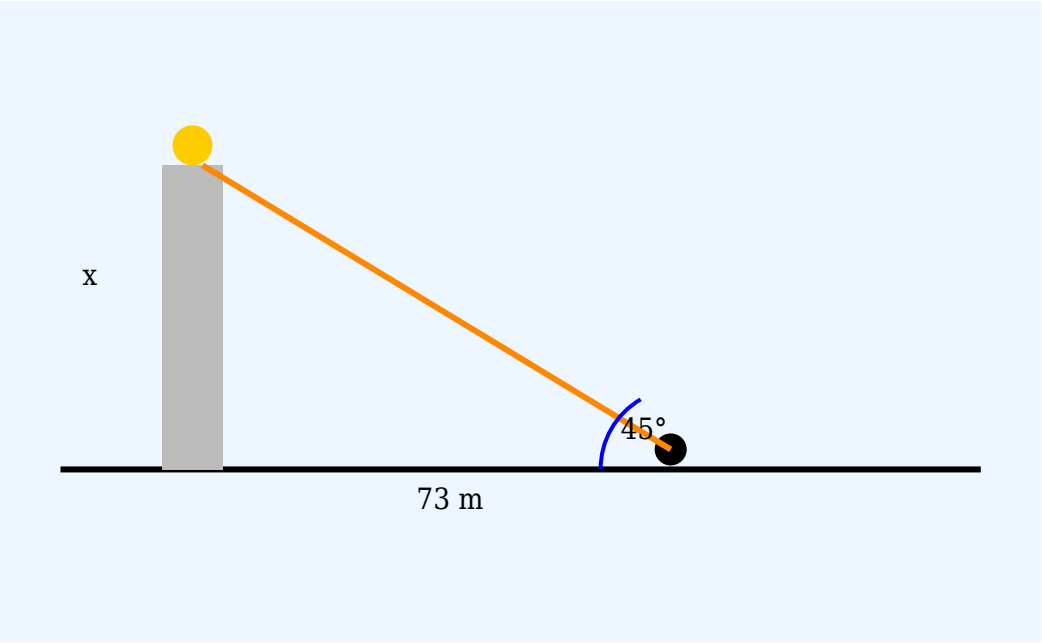
Hypotenuse = 58 / 0.5

Hypotenuse = 116 m

Answer: 116 m

Question 5

A tourist looks at the top of a bridge at an angle of elevation of 45°. Find the height of the bridge if the distance from the base is 73 m.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 45° = Height / 73

1 = Height / 73

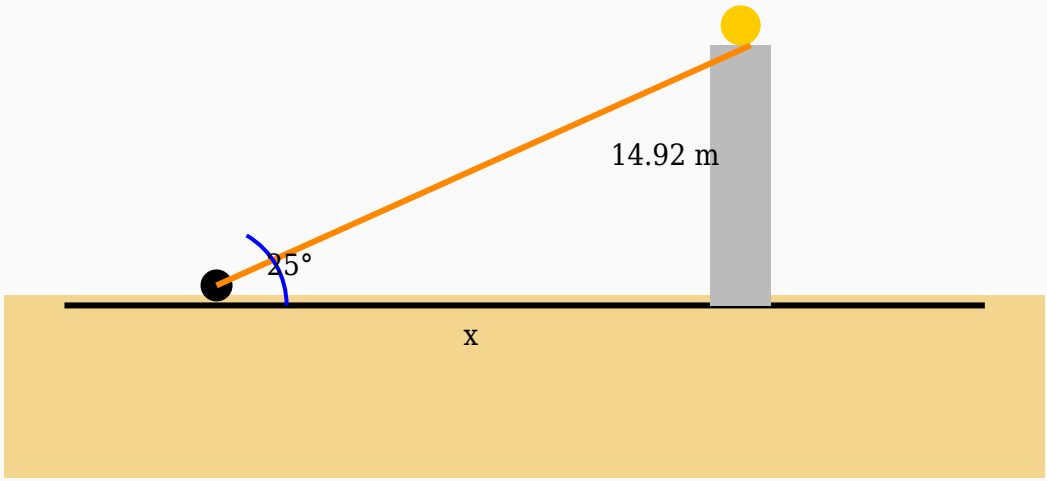
Height = 73 × 1

Height = 73 m

Answer: 73 m

Question 6

The angle of elevation to the top of a bridge is 25°. Find the distance from the observer to the base if the height is 14.92 m.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 25° = 14.92 / Distance

0.47 = 14.92 / Distance

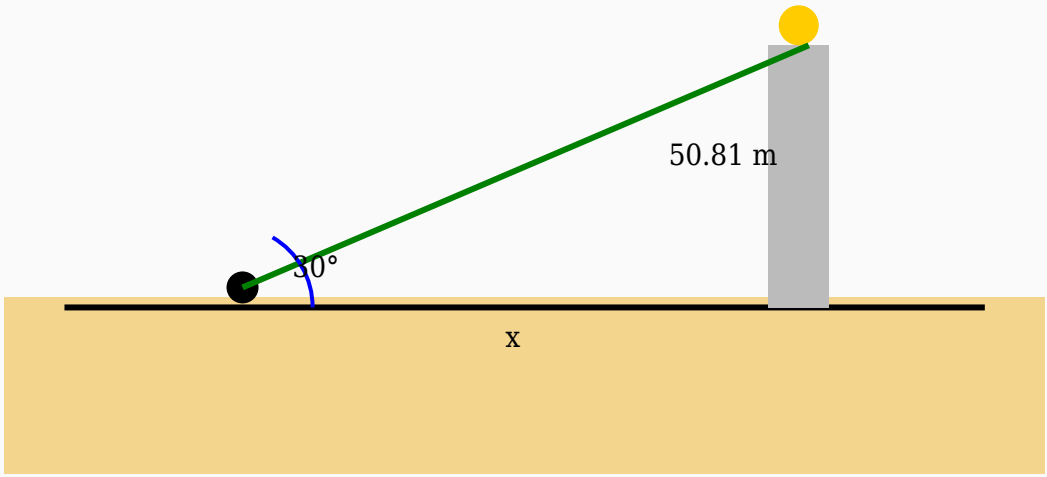
Distance = 14.92 / 0.47

Distance = 31.74 m

Answer: 31.74 m

Question 7

The height of a electric pole is 50.81 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° = 50.81 / Distance

0.58 = 50.81 / Distance

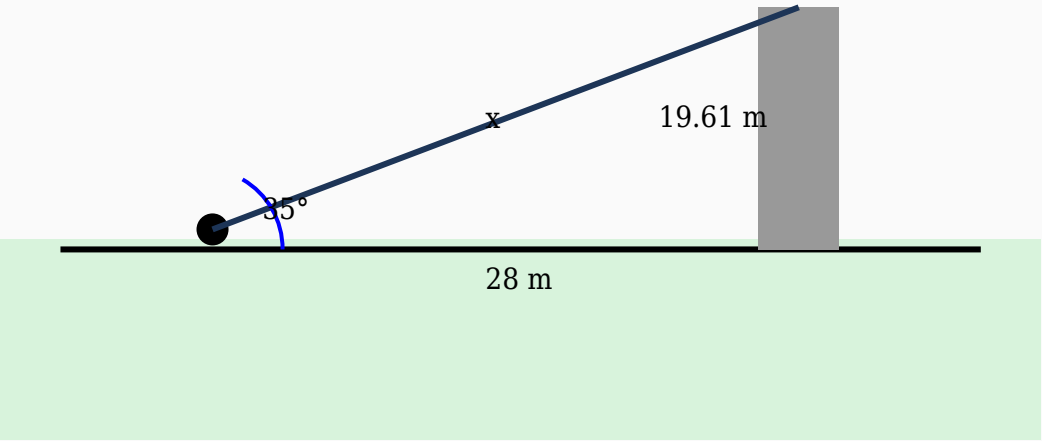
Distance = 50.81 / 0.58

Distance = 87.6 m

Answer: 87.6 m

Question 8

An observer looks at the top of a tree making an angle of elevation of 35°. Determine the length of the line of sight if the horizontal distance is 28 m.



Solution:

Using:
cos θ = Adjacent / Hypotenuse

cos 35° = 28 / Hypotenuse

0.82 = 28 / Hypotenuse

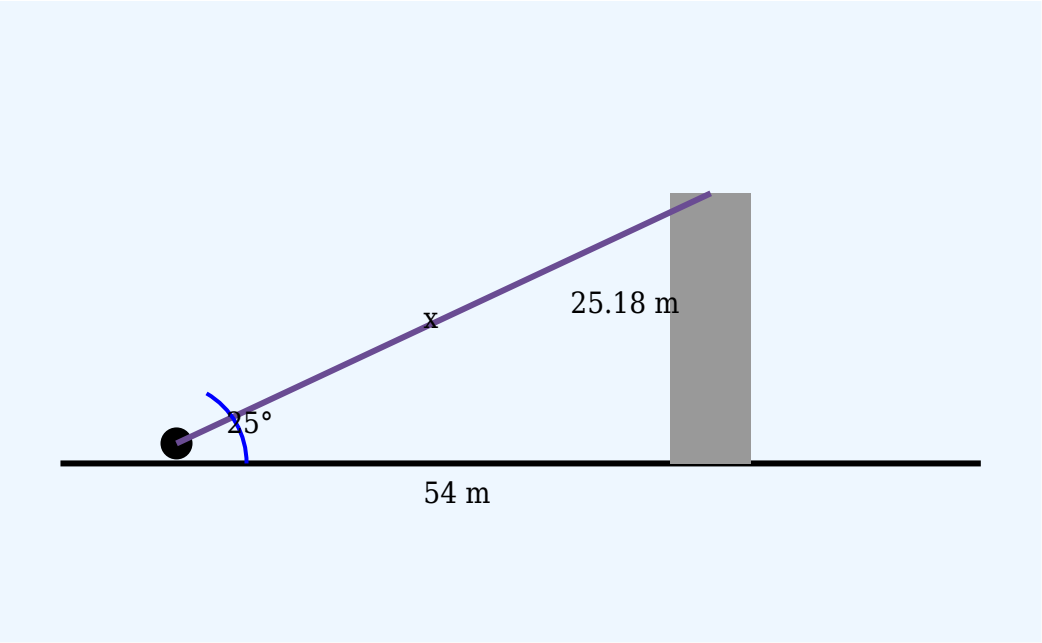
Hypotenuse = 28 / 0.82

Hypotenuse = 34.15 m

Answer: 34.15 m

Question 9

An observer looks at the top of a water tank making an angle of elevation of 25°. Determine the length of the line of sight if the horizontal distance is 54 m.



Solution:

Using:
cos θ = Adjacent / Hypotenuse

cos 25° = 54 / Hypotenuse

0.91 = 54 / Hypotenuse

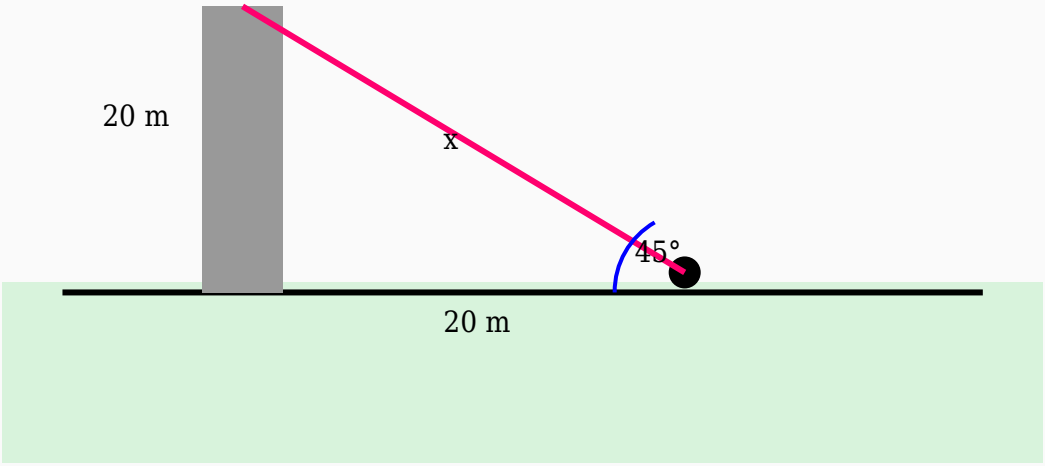
Hypotenuse = 54 / 0.91

Hypotenuse = 59.34 m

Answer: 59.34 m

Question 10

An observer looks at the top of a lighthouse making an angle of elevation of 45°. Determine the length of the line of sight if the horizontal distance is 20 m.



Solution:

Using:
cos θ = Adjacent / Hypotenuse

cos 45° = 20 / Hypotenuse

0.71 = 20 / Hypotenuse

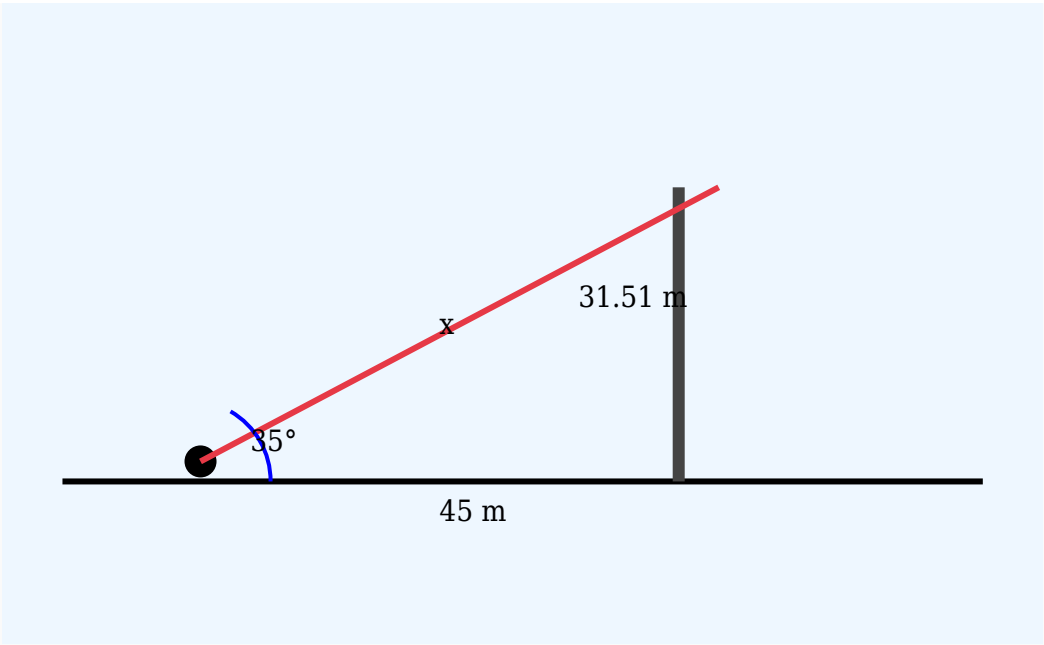
Hypotenuse = 20 / 0.71

Hypotenuse = 28.17 m

Answer: 28.17 m

Question 11

A person standing 45 m away from a lighthouse observes its top at an angle of elevation of 35°. Find the line of sight.



Solution:

Using:
cos θ = Adjacent / Hypotenuse

cos 35° = 45 / Hypotenuse

0.82 = 45 / Hypotenuse

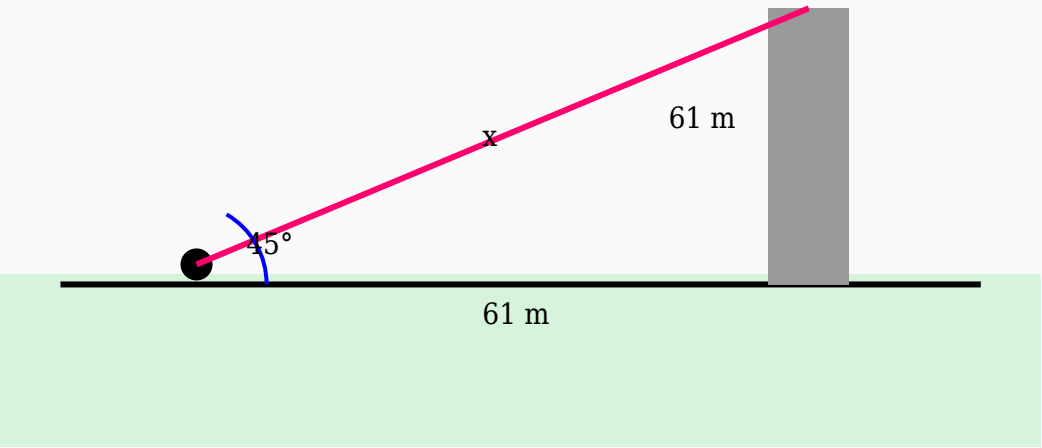
Hypotenuse = 45 / 0.82

Hypotenuse = 54.88 m

Answer: 54.88 m

Question 12

An observer observes the top of a water tank at an angle of elevation of 45°. If the horizontal distance is 61 m, find the line of sight distance.



Solution:

Using:
cos θ = Adjacent / Hypotenuse

cos 45° = 61 / Hypotenuse

0.71 = 61 / Hypotenuse

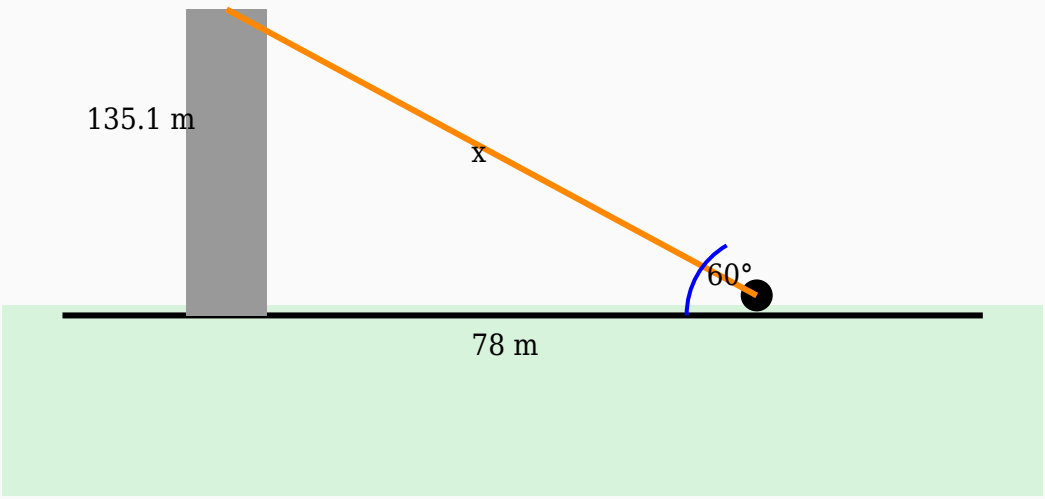
Hypotenuse = 61 / 0.71

Hypotenuse = 85.92 m

Answer: 85.92 m

Question 13

A person standing 78 m away from a crane observes its top at an angle of elevation of 60°. Find the line of sight.



Solution:

Using:
cos θ = Adjacent / Hypotenuse

cos 60° = 78 / Hypotenuse

0.5 = 78 / Hypotenuse

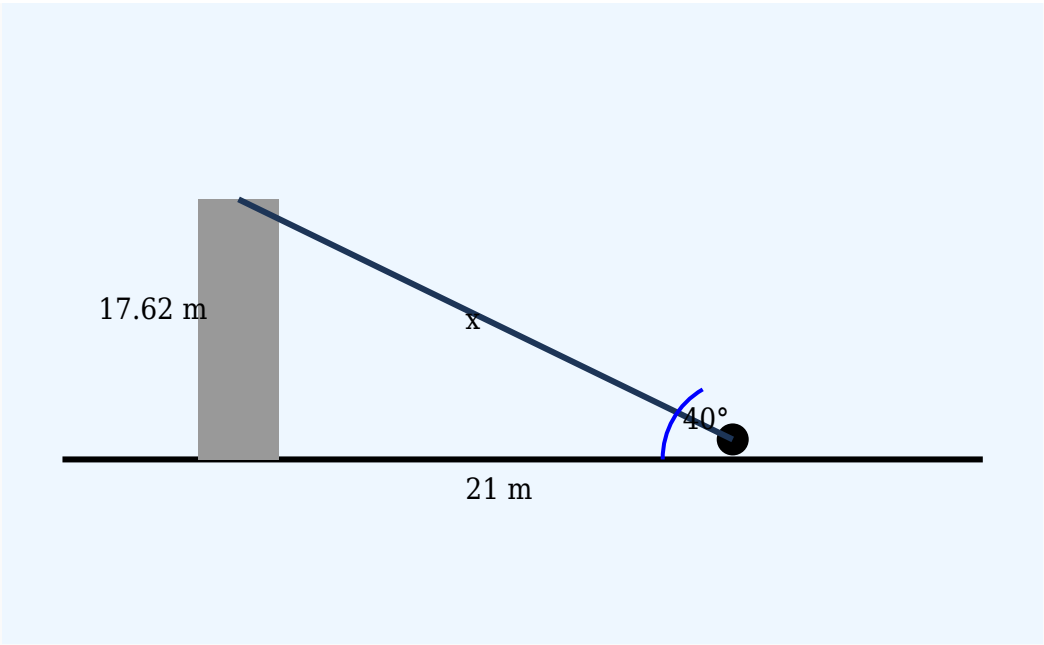
Hypotenuse = 78 / 0.5

Hypotenuse = 156 m

Answer: 156 m

Question 14

An observer looks at the top of a electric pole making an angle of elevation of 40°. Determine the length of the line of sight if the horizontal distance is 21 m.



Solution:

Using:
cos θ = Adjacent / Hypotenuse

cos 40° = 21 / Hypotenuse

0.77 = 21 / Hypotenuse

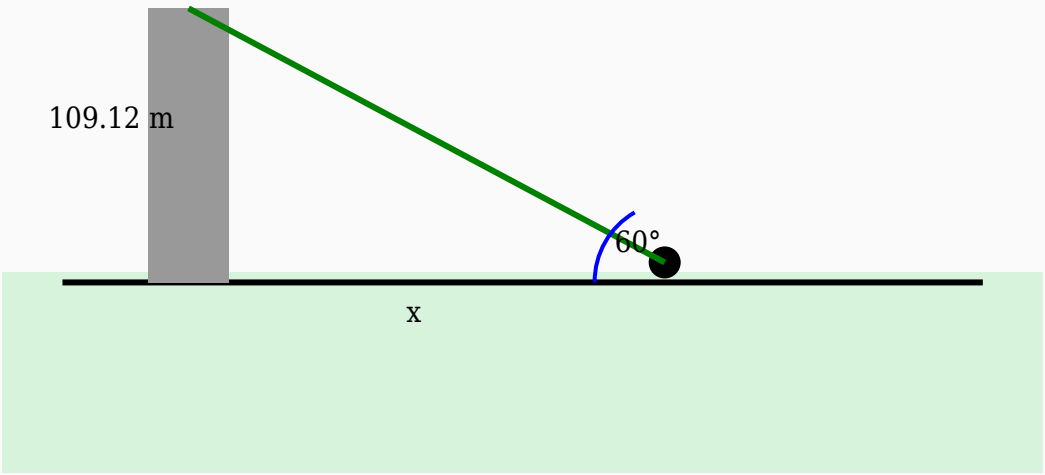
Hypotenuse = 21 / 0.77

Hypotenuse = 27.27 m

Answer: 27.27 m

Question 15

The angle of elevation to the top of a water tank is 60°. Find the distance from the observer to the base if the height is 109.12 m.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 60° = 109.12 / Distance

1.73 = 109.12 / Distance

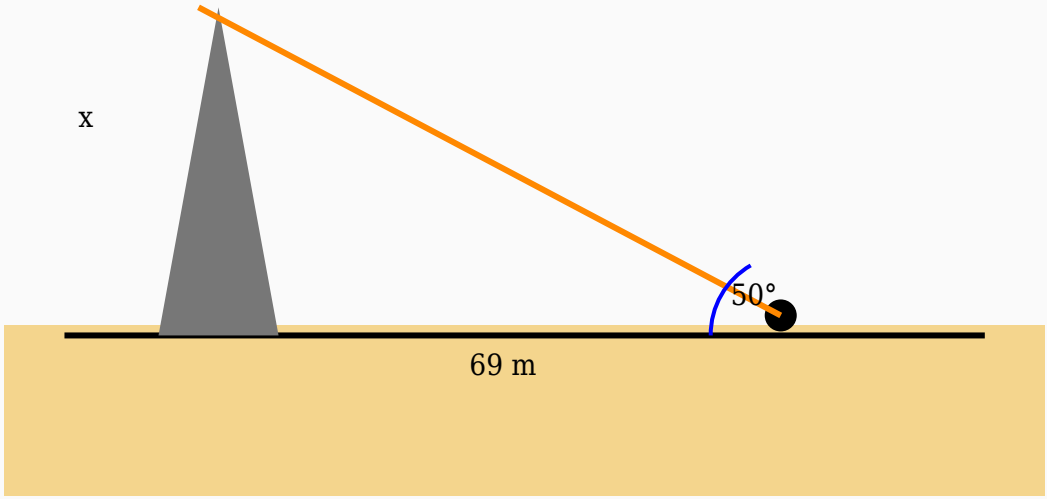
Distance = 109.12 / 1.73

Distance = 63.08 m

Answer: 63.08 m

Question 16

A woman 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 69 m.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 50° = Height / 69

1.19 = Height / 69

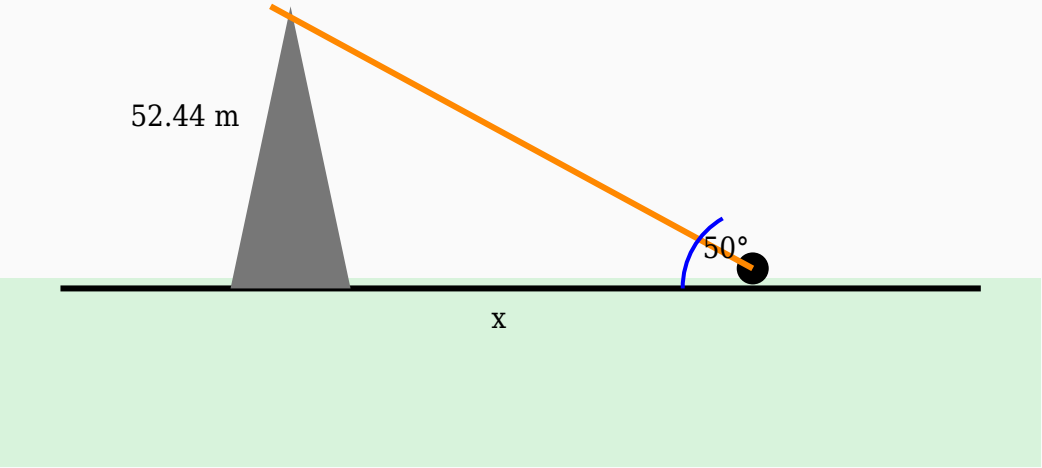
Height = 69 × 1.19

Height = 82.23 m

Answer: 82.23 m

Question 17

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 52.44 m.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 50° = 52.44 / Distance

1.19 = 52.44 / Distance

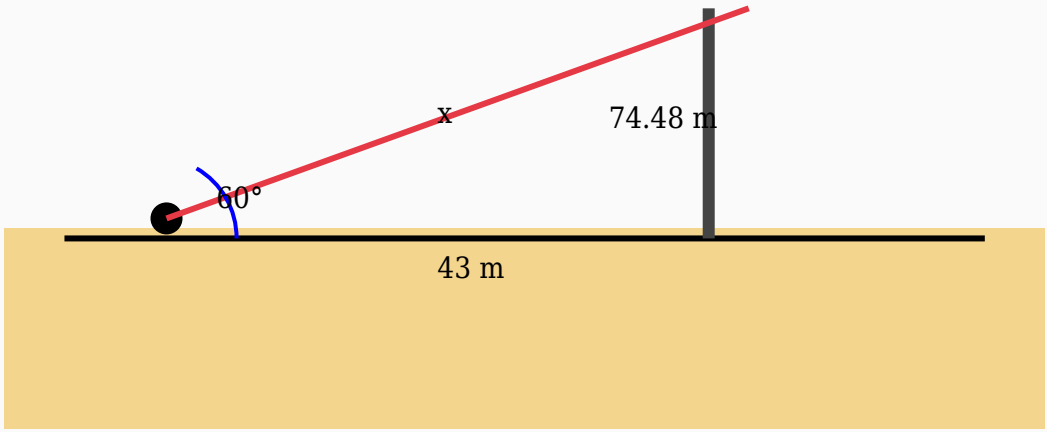
Distance = 52.44 / 1.19

Distance = 44.07 m

Answer: 44.07 m

Question 18

A person standing 43 m away from a bridge observes its top at an angle of elevation of 60°. Find the line of sight.



Solution:

Using:
cos θ = Adjacent / Hypotenuse

cos 60° = 43 / Hypotenuse

0.5 = 43 / Hypotenuse

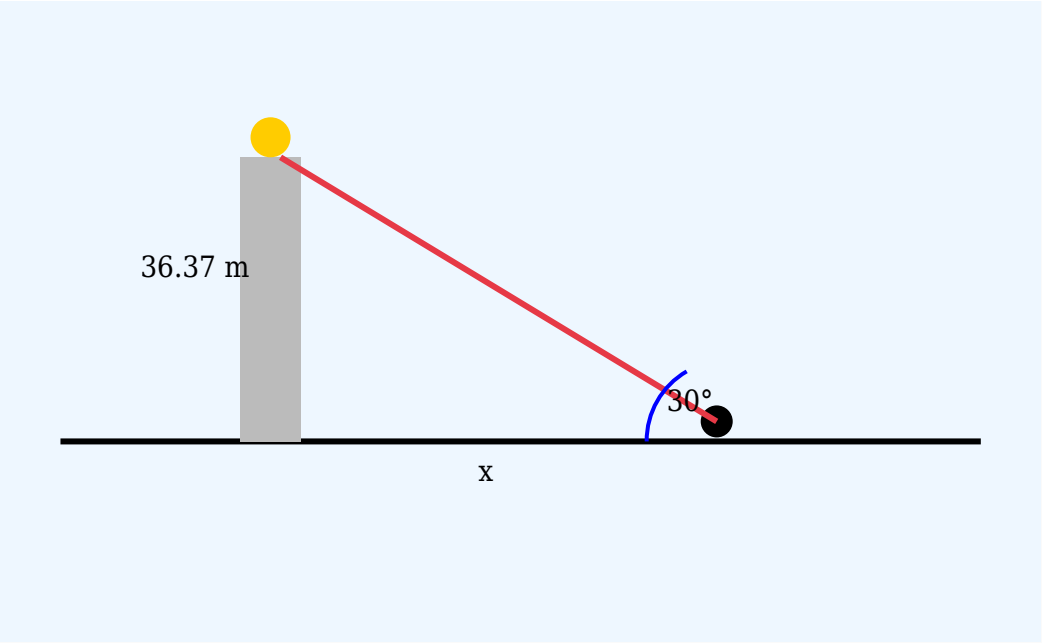
Hypotenuse = 43 / 0.5

Hypotenuse = 86 m

Answer: 86 m

Question 19

A girl observes the top of a tower at an angle of elevation of 30°. If the height of the tower is 36.37 m, find the horizontal distance.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 30° = 36.37 / Distance

0.58 = 36.37 / Distance

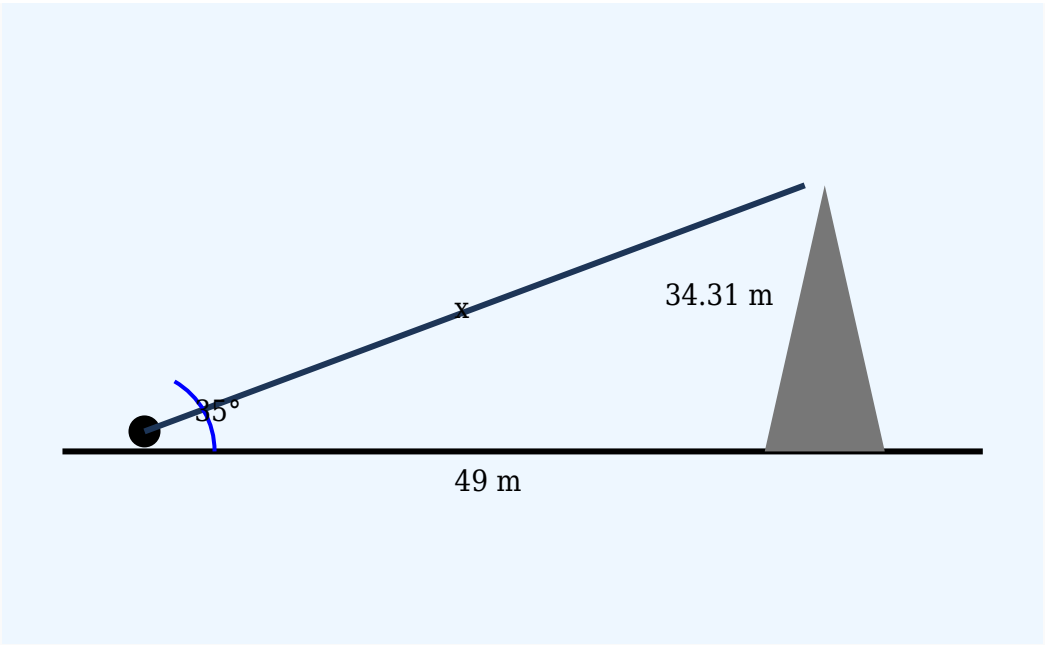
Distance = 36.37 / 0.58

Distance = 62.71 m

Answer: 62.71 m

Question 20

The angle of elevation to the top of a building is 35°. If the observer is 49 m from the base, calculate the hypotenuse.



Solution:

Using:
cos θ = Adjacent / Hypotenuse

cos 35° = 49 / Hypotenuse

0.82 = 49 / Hypotenuse

Hypotenuse = 49 / 0.82

Hypotenuse = 59.76 m

Answer: 59.76 m