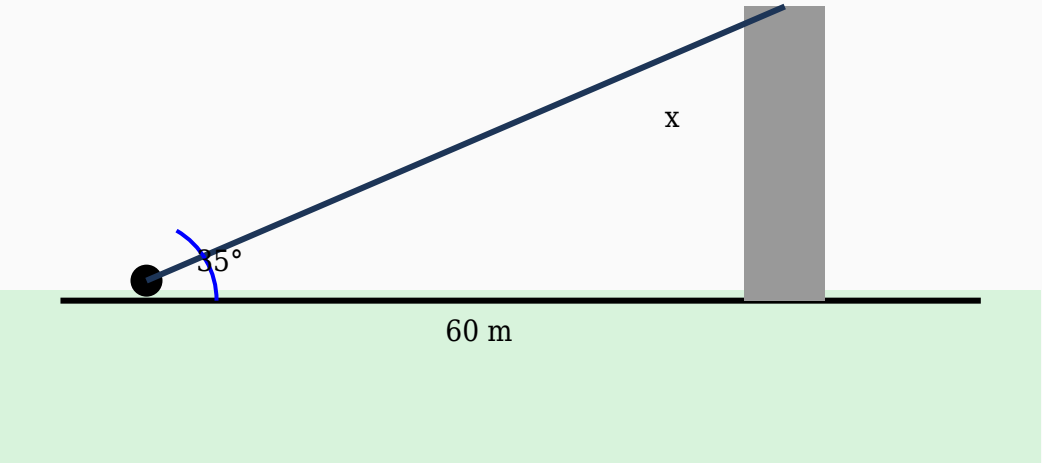
Angle of Elevation Solved Worksheet

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 θ = Opposite / Adjacent

tan 35° = Height / 60

0.7 = Height / 60

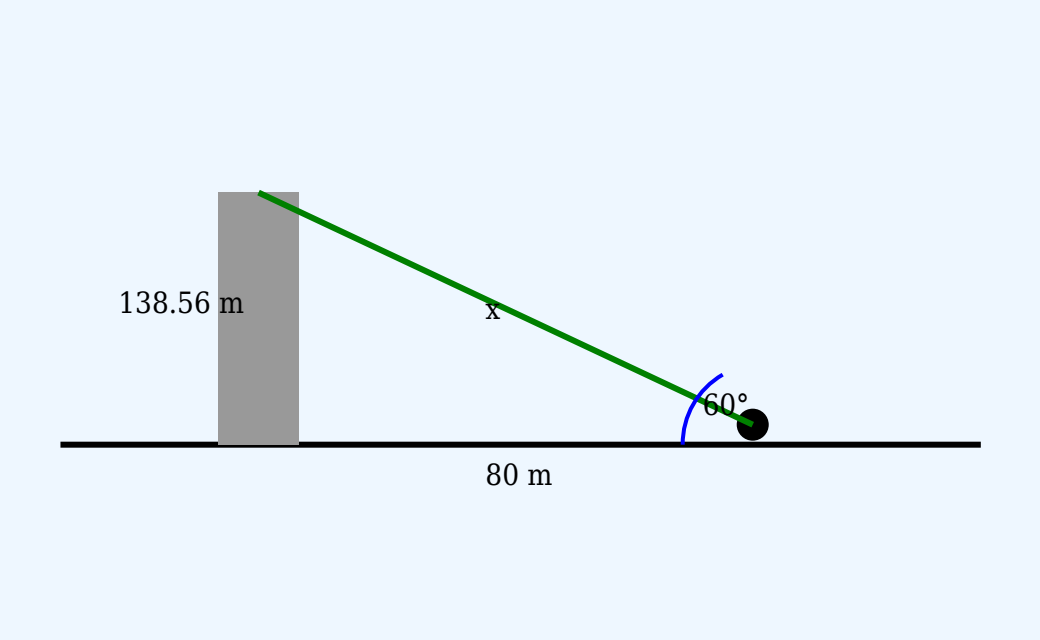
Height = 60 × 0.7

Height = 42.01 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 θ = Adjacent / Hypotenuse

cos 60° = 80 / Hypotenuse

0.5 = 80 / Hypotenuse

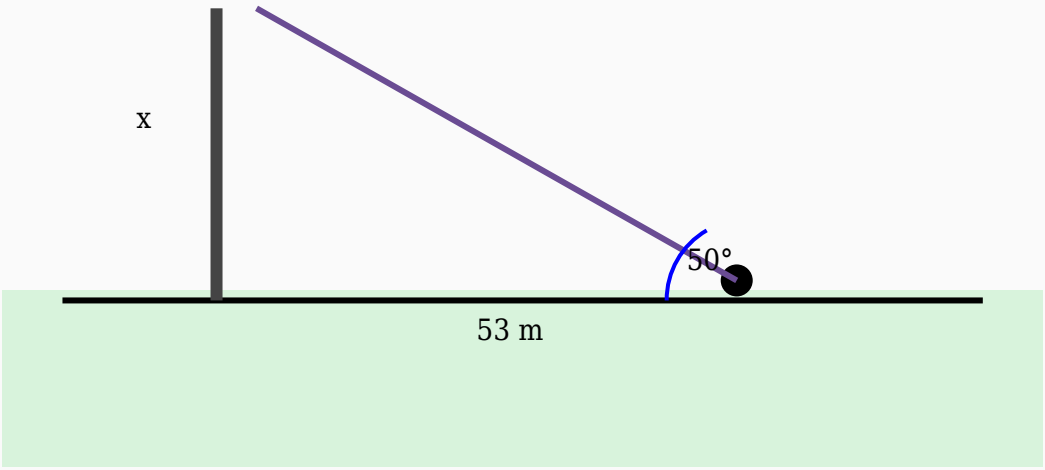
Hypotenuse = 80 / 0.5

Hypotenuse = 160 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 θ = Opposite / Adjacent

tan 50° = Height / 53

1.19 = Height / 53

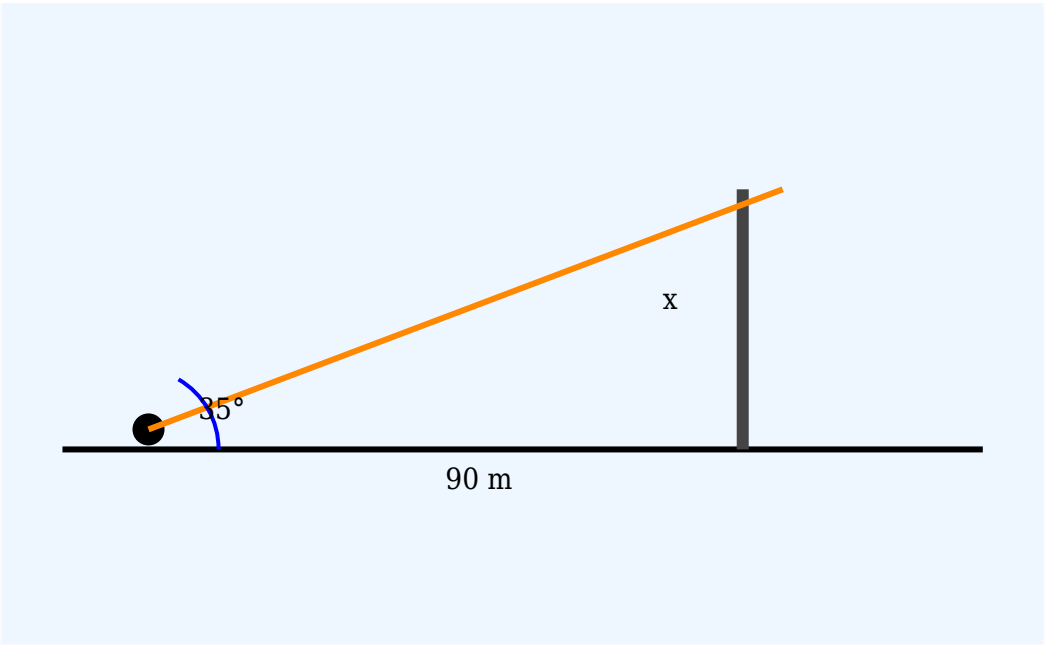
Height = 53 × 1.19

Height = 63.16 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 θ = Opposite / Adjacent

tan 35° = Height / 90

0.7 = Height / 90

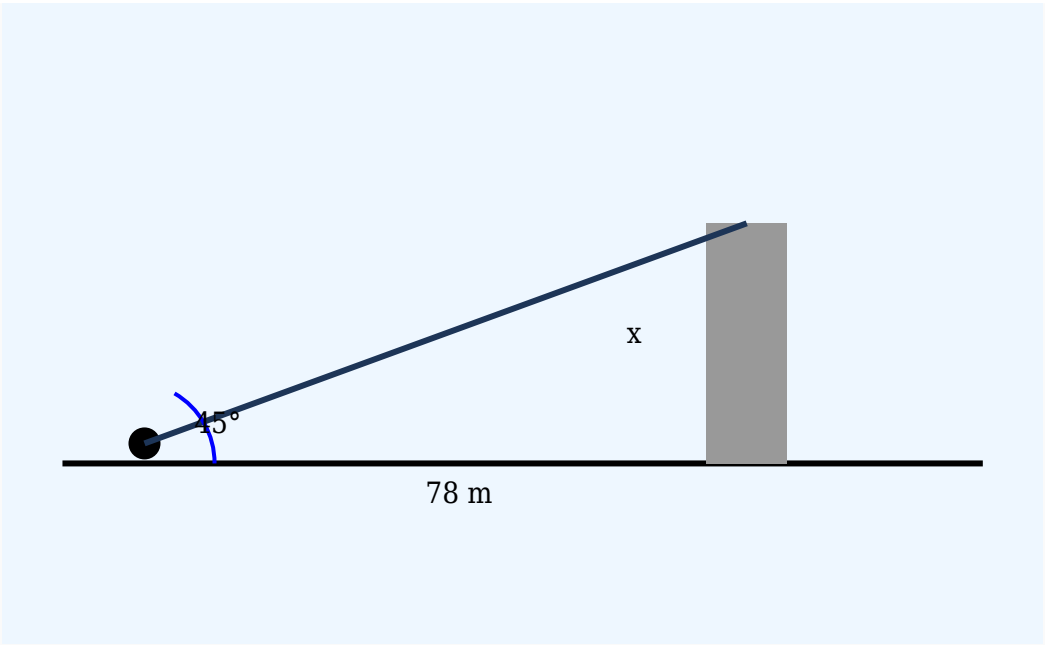
Height = 90 × 0.7

Height = 63.02 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 θ = Opposite / Adjacent

tan 45° = Height / 78

1 = Height / 78

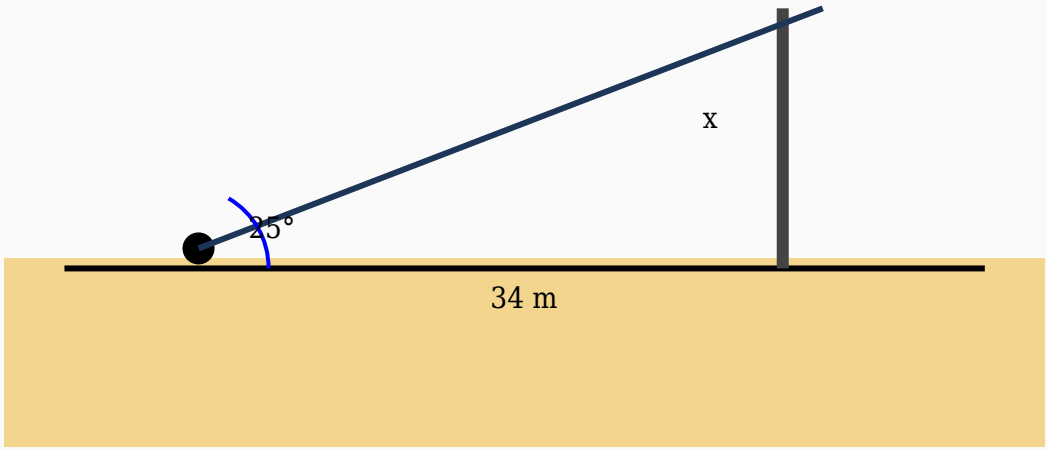
Height = 78 × 1

Height = 78 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 θ = Opposite / Adjacent

tan 25° = Height / 34

0.47 = Height / 34

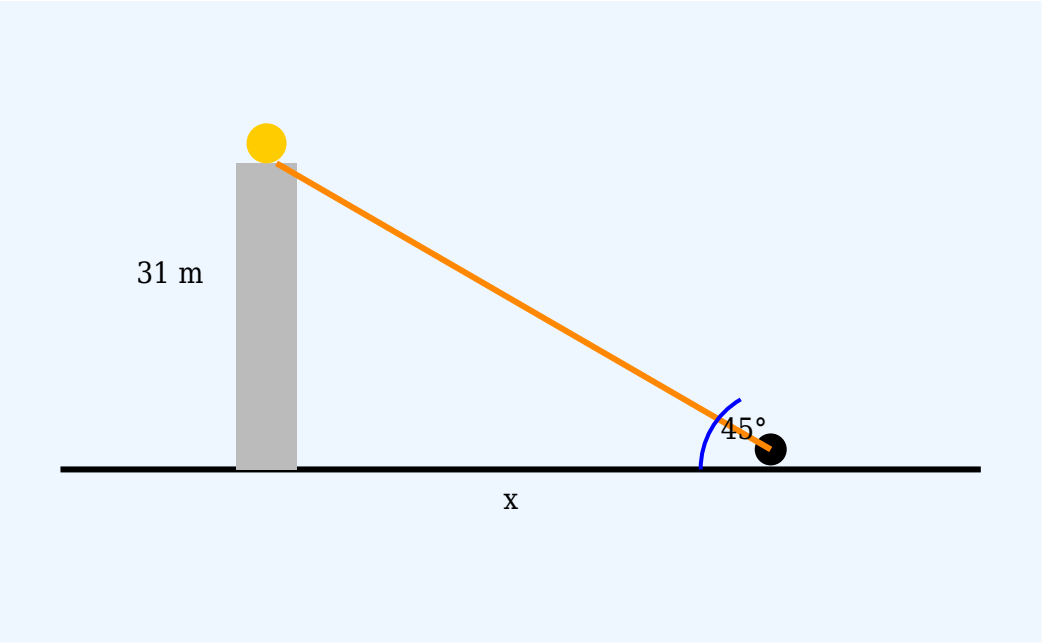
Height = 34 × 0.47

Height = 15.85 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 θ = Opposite / Adjacent

tan 45° = 31 / Distance

1 = 31 / Distance

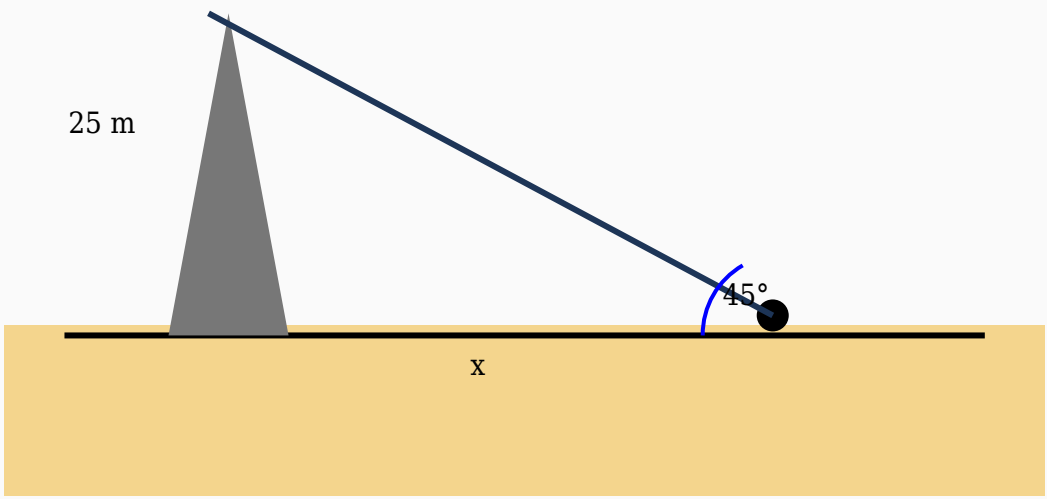
Distance = 31 / 1

Distance = 31 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 θ = Opposite / Adjacent

tan 45° = 25 / Distance

1 = 25 / Distance

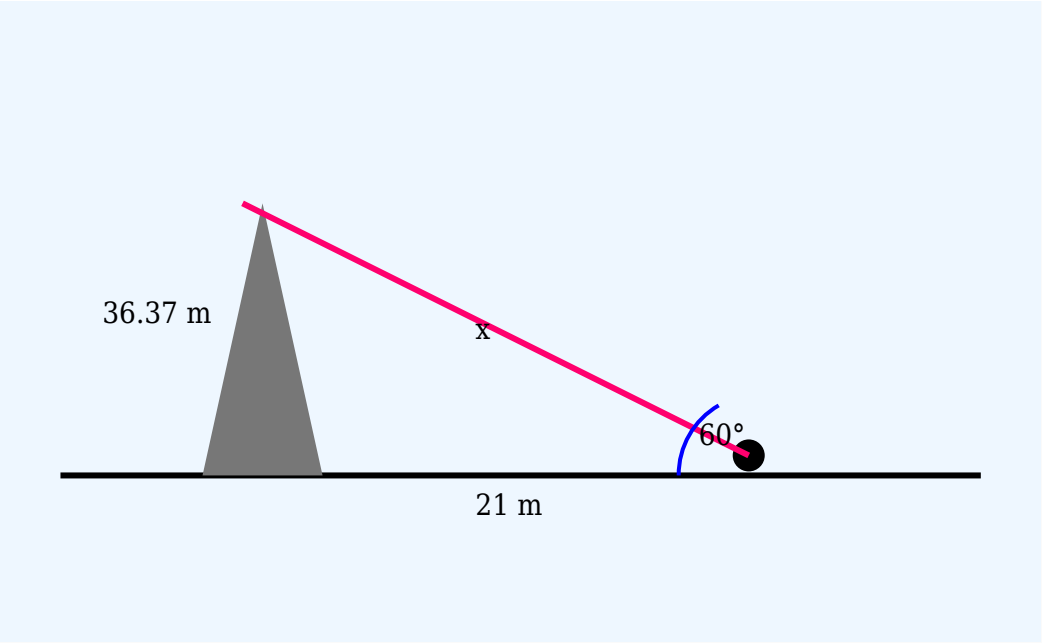
Distance = 25 / 1

Distance = 25 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 θ = Adjacent / Hypotenuse

cos 60° = 21 / Hypotenuse

0.5 = 21 / Hypotenuse

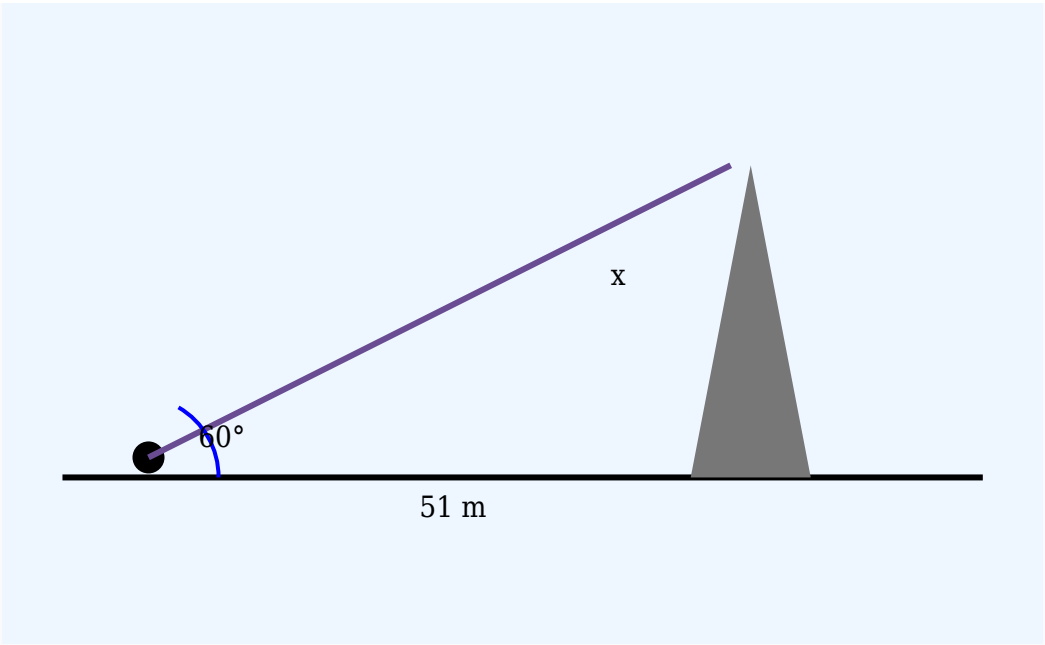
Hypotenuse = 21 / 0.5

Hypotenuse = 42 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 θ = Opposite / Adjacent

tan 60° = Height / 51

1.73 = Height / 51

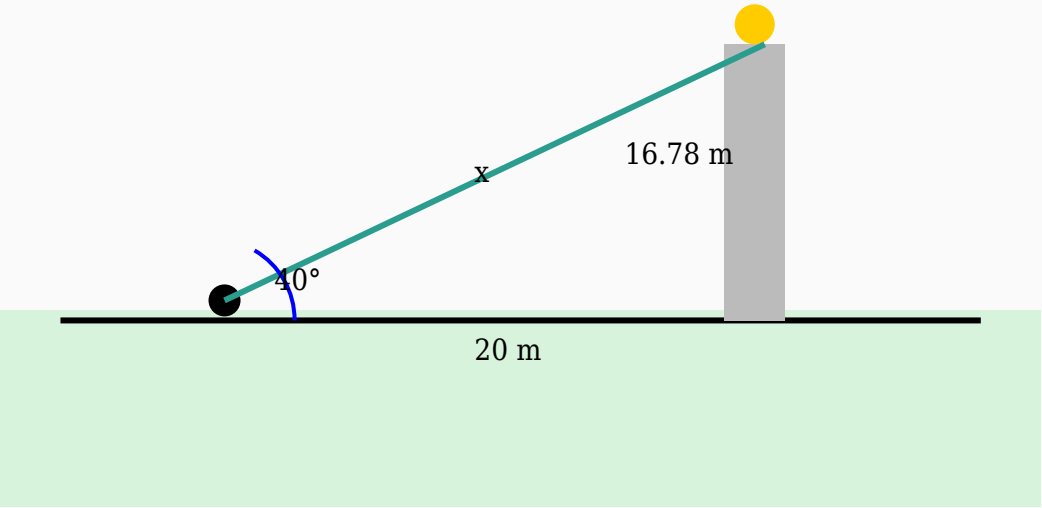
Height = 51 × 1.73

Height = 88.33 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 θ = Adjacent / Hypotenuse

cos 40° = 20 / Hypotenuse

0.77 = 20 / Hypotenuse

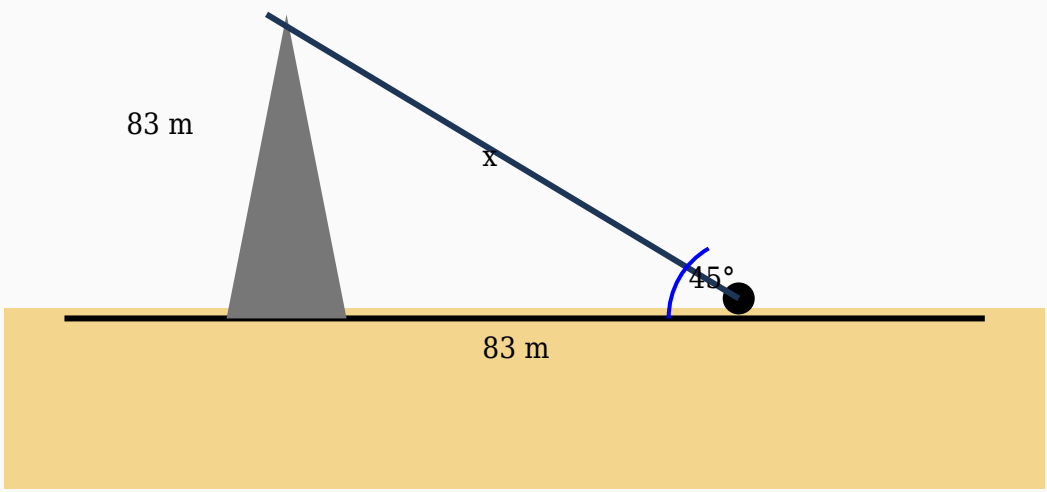
Hypotenuse = 20 / 0.77

Hypotenuse = 25.97 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 θ = Adjacent / Hypotenuse

cos 45° = 83 / Hypotenuse

0.71 = 83 / Hypotenuse

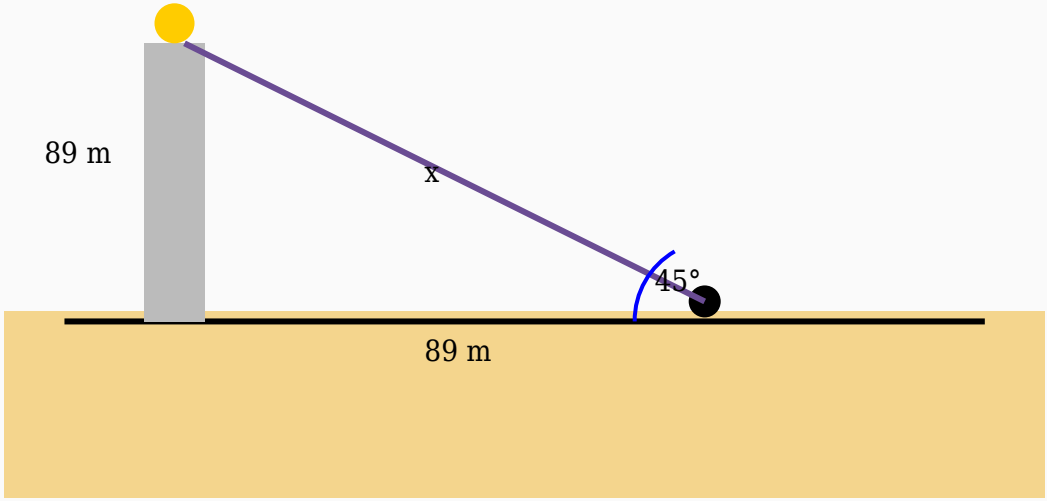
Hypotenuse = 83 / 0.71

Hypotenuse = 116.9 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 θ = Adjacent / Hypotenuse

cos 45° = 89 / Hypotenuse

0.71 = 89 / Hypotenuse

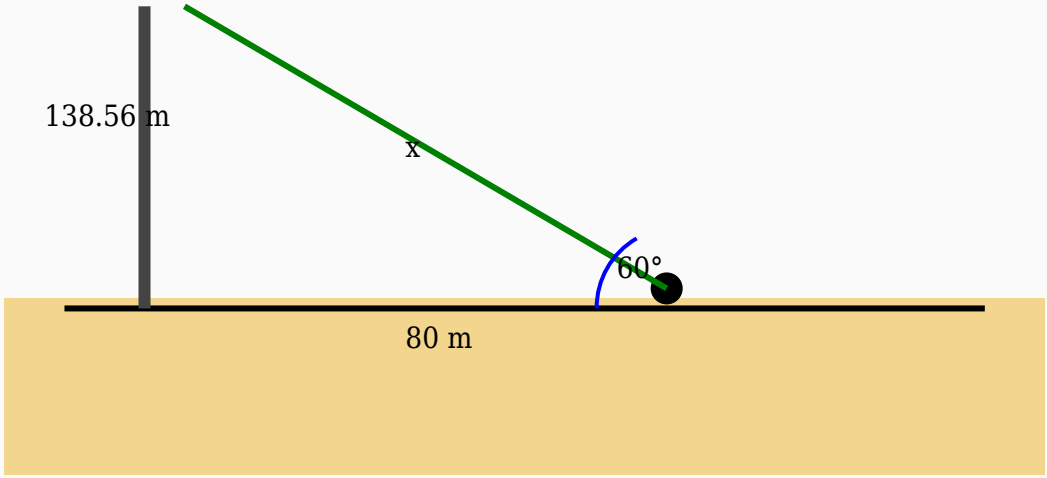
Hypotenuse = 89 / 0.71

Hypotenuse = 125.35 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 θ = Adjacent / Hypotenuse

cos 60° = 80 / Hypotenuse

0.5 = 80 / Hypotenuse

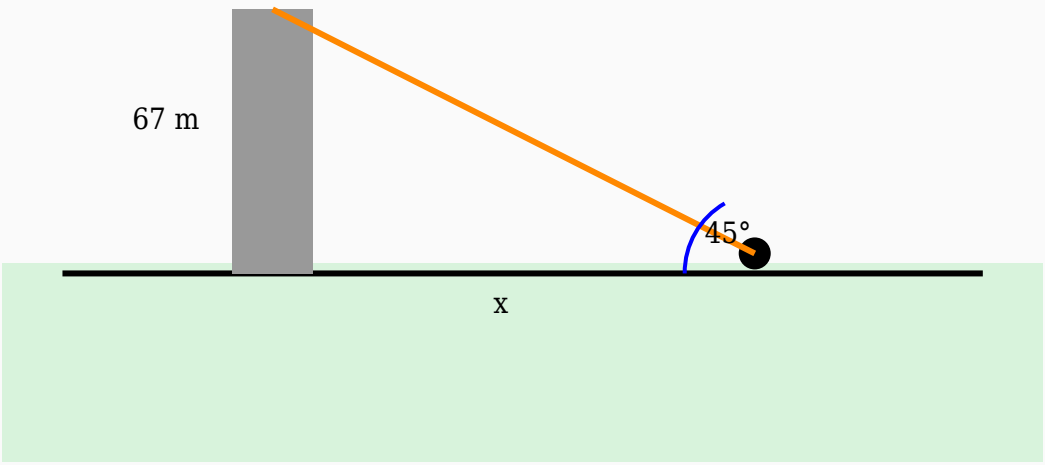
Hypotenuse = 80 / 0.5

Hypotenuse = 160 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 θ = Opposite / Adjacent

tan 45° = 67 / Distance

1 = 67 / Distance

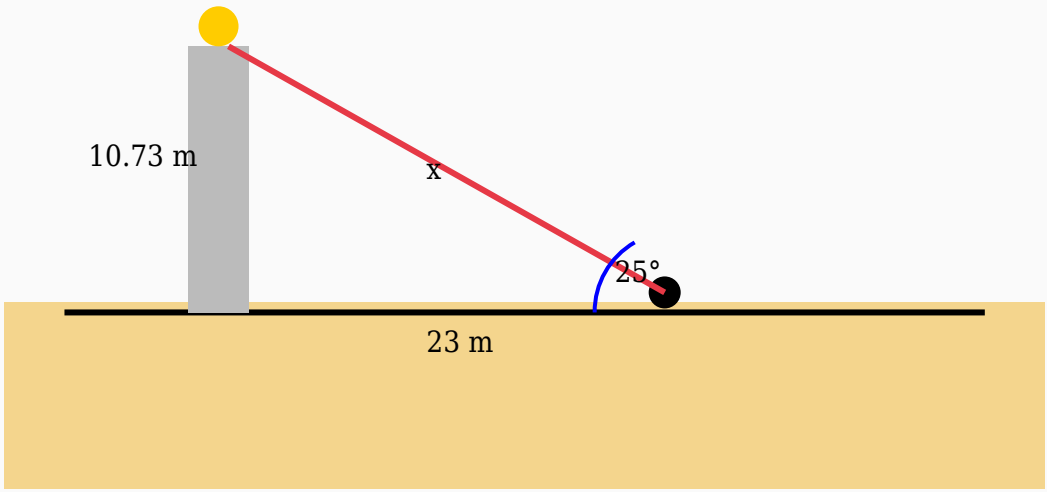
Distance = 67 / 1

Distance = 67 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 θ = Adjacent / Hypotenuse

cos 25° = 23 / Hypotenuse

0.91 = 23 / Hypotenuse

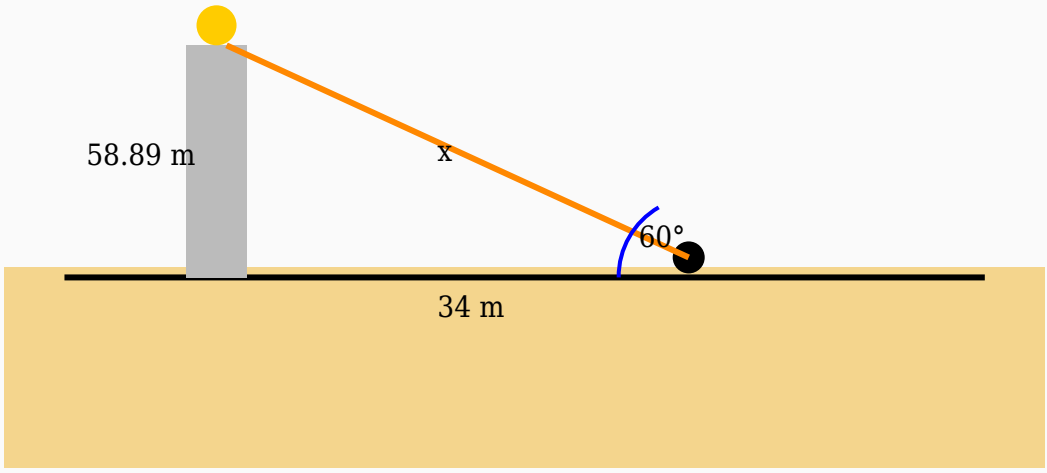
Hypotenuse = 23 / 0.91

Hypotenuse = 25.27 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 θ = Adjacent / Hypotenuse

cos 60° = 34 / Hypotenuse

0.5 = 34 / Hypotenuse

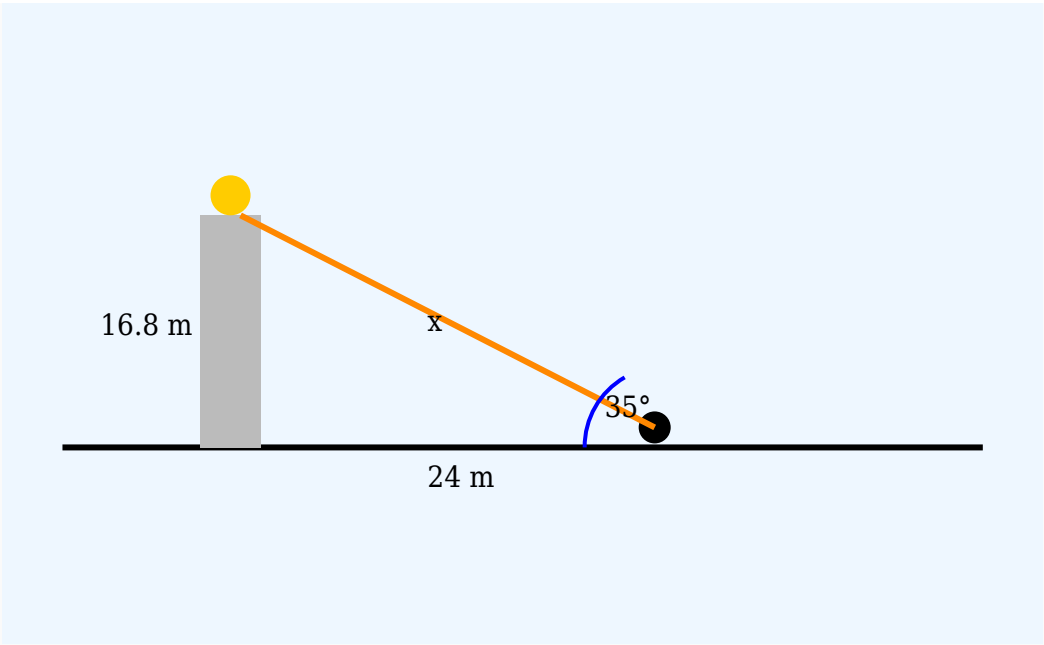
Hypotenuse = 34 / 0.5

Hypotenuse = 68 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 θ = Adjacent / Hypotenuse

cos 35° = 24 / Hypotenuse

0.82 = 24 / Hypotenuse

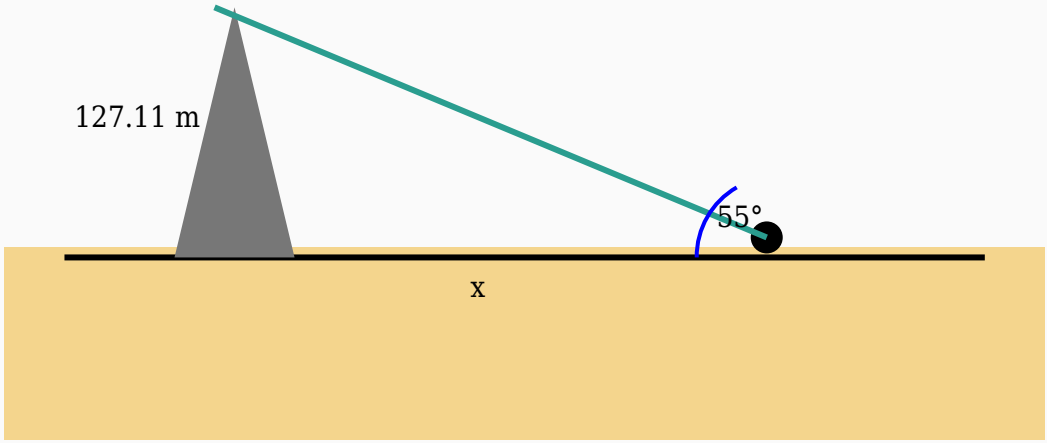
Hypotenuse = 24 / 0.82

Hypotenuse = 29.27 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 θ = Opposite / Adjacent

tan 55° = 127.11 / Distance

1.43 = 127.11 / Distance

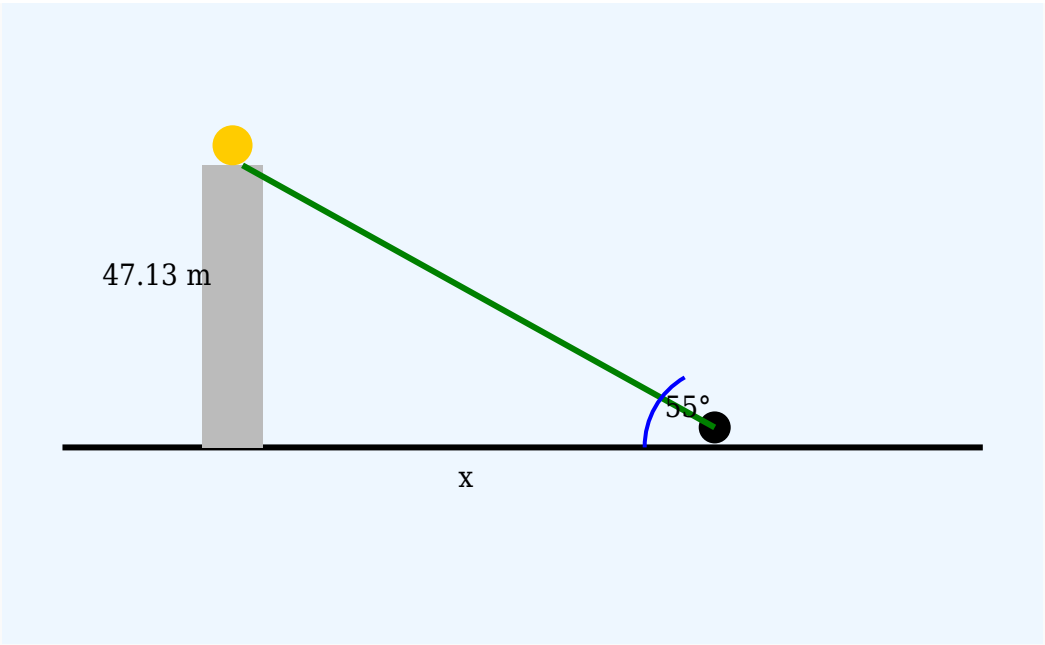
Distance = 127.11 / 1.43

Distance = 88.89 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 θ = Opposite / Adjacent

tan 55° = 47.13 / Distance

1.43 = 47.13 / Distance

Distance = 47.13 / 1.43

Distance = 32.96 m

Answer: 32.96 m