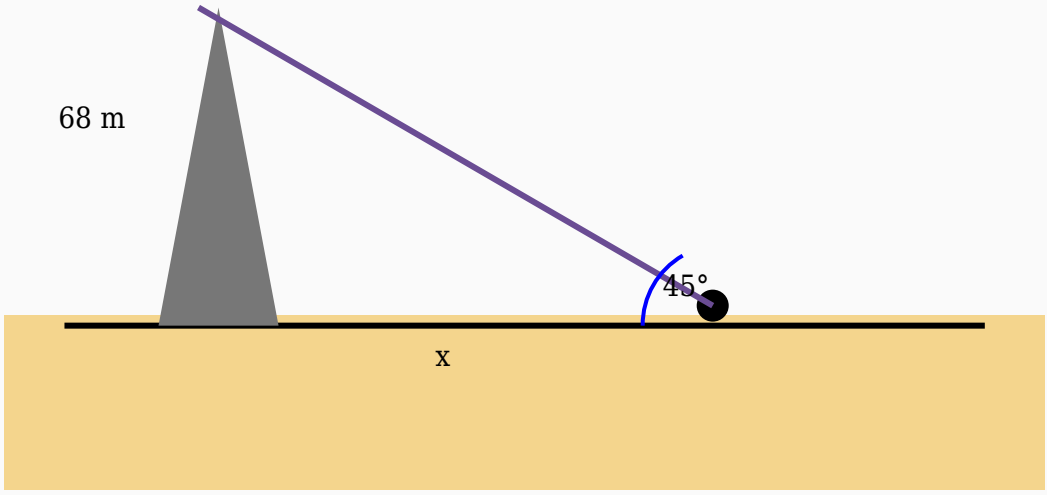
Angle of Elevation Solved Worksheet

Question 1

The height of a flagpole is 68 m. If the angle of elevation from a point on the ground is 45°, calculate the horizontal distance.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 45° = 68 / Distance

1 = 68 / Distance

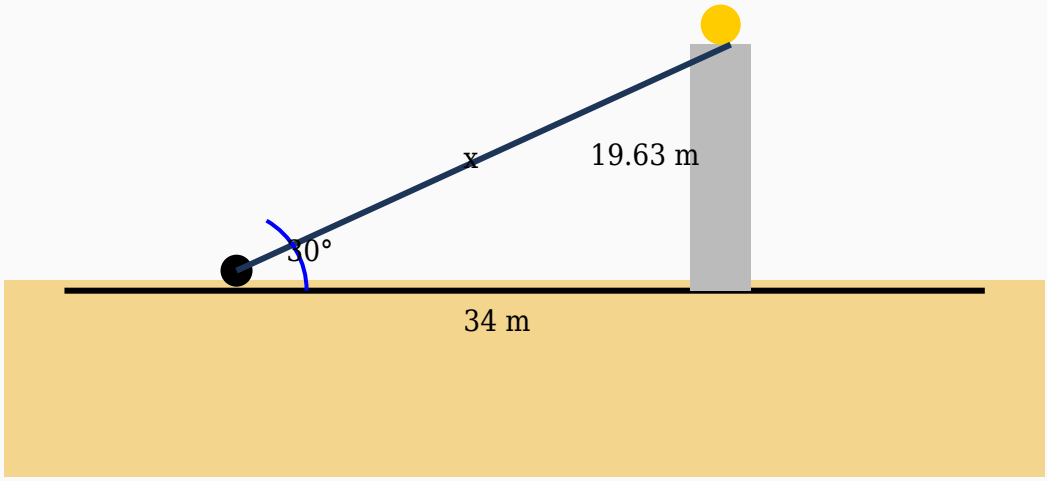
Distance = 68 / 1

Distance = 68 m

Answer: 68 m

Question 2

A person standing 34 m away from a crane observes its top at an angle of elevation of 30°. Find the line of sight.



Solution:

Using:
cos θ = Adjacent / Hypotenuse

cos 30° = 34 / Hypotenuse

0.87 = 34 / Hypotenuse

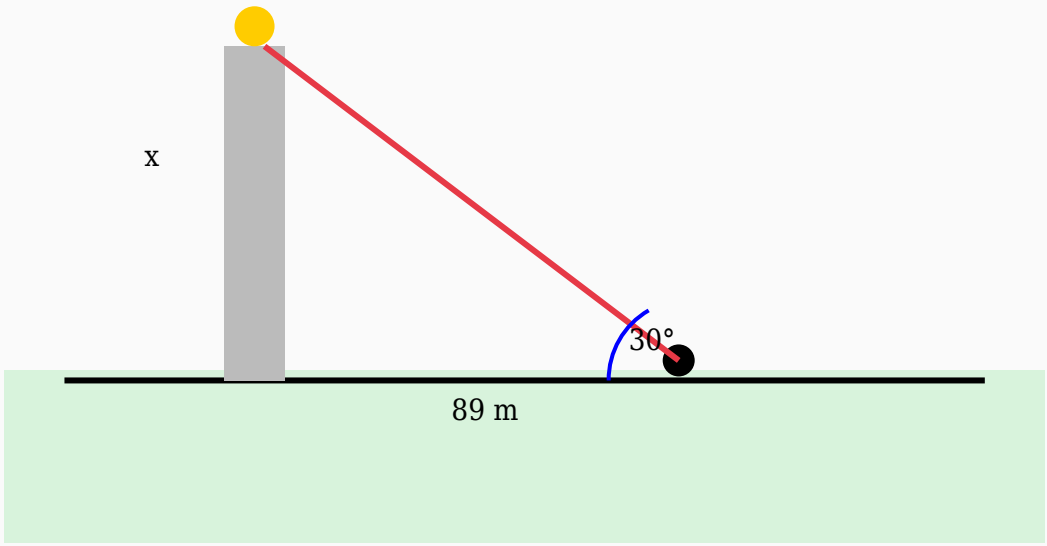
Hypotenuse = 34 / 0.87

Hypotenuse = 39.08 m

Answer: 39.08 m

Question 3

A person measures the angle of elevation to the top of a lighthouse as 30°. If the distance from the lighthouse is 89 m, determine its height.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 30° = Height / 89

0.58 = Height / 89

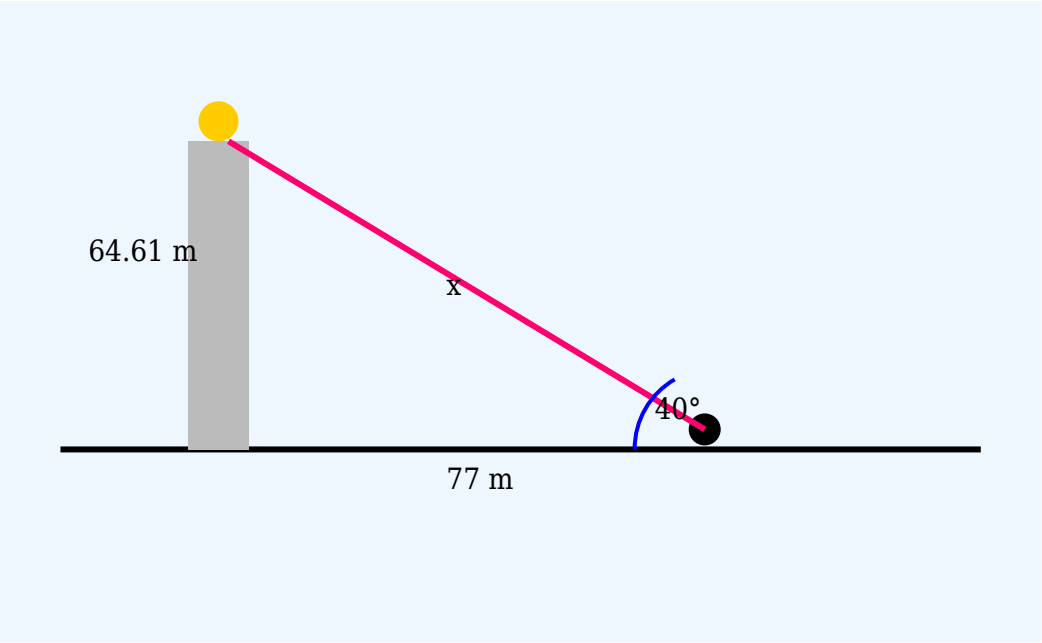
Height = 89 × 0.58

Height = 51.38 m

Answer: 51.38 m

Question 4

A boy observes the top of a crane at an angle of elevation of 40°. If the horizontal distance is 77 m, find the line of sight distance.



Solution:

Using:
cos θ = Adjacent / Hypotenuse

cos 40° = 77 / Hypotenuse

0.77 = 77 / Hypotenuse

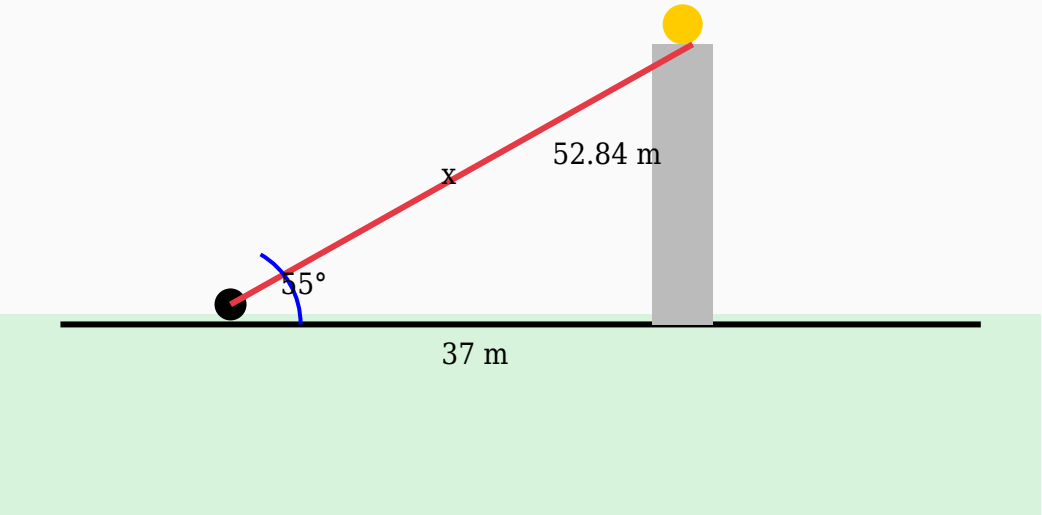
Hypotenuse = 77 / 0.77

Hypotenuse = 100 m

Answer: 100 m

Question 5

The angle of elevation to the top of a flagpole is 55°. If the observer is 37 m from the base, calculate the hypotenuse.



Solution:

Using:
cos θ = Adjacent / Hypotenuse

cos 55° = 37 / Hypotenuse

0.57 = 37 / Hypotenuse

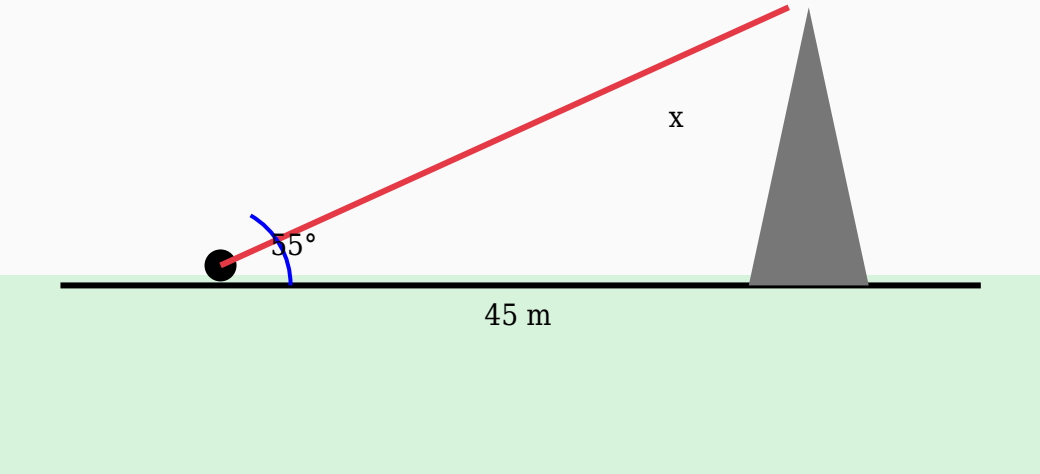
Hypotenuse = 37 / 0.57

Hypotenuse = 64.91 m

Answer: 64.91 m

Question 6

A surveyor looks at the top of a tree at an angle of elevation of 55°. Find the height of the tree if the distance from the base is 45 m.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 55° = Height / 45

1.43 = Height / 45

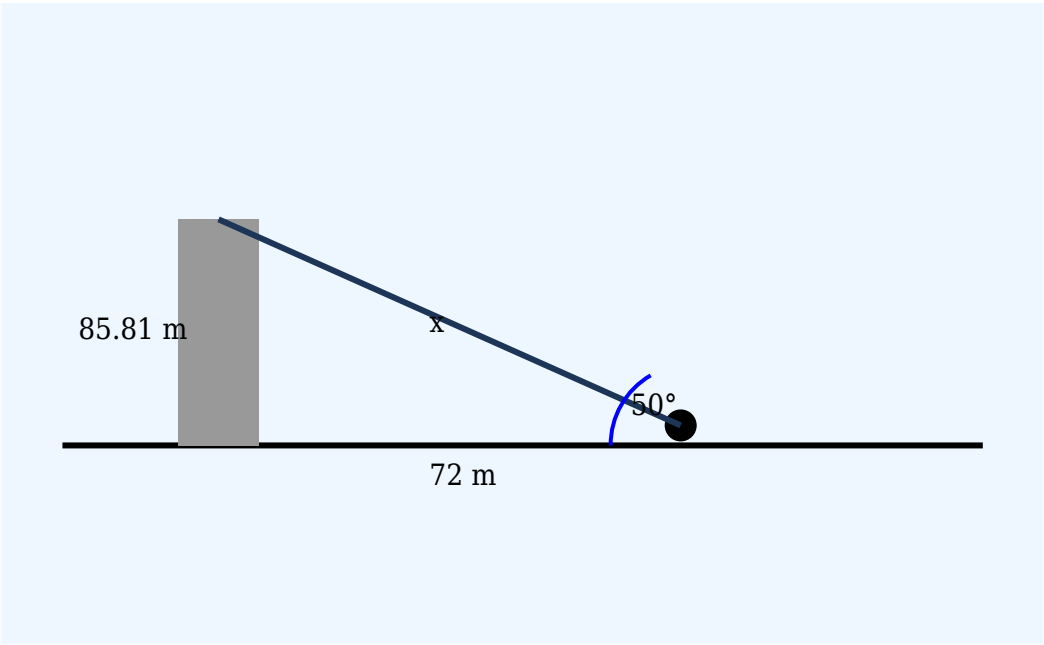
Height = 45 × 1.43

Height = 64.27 m

Answer: 64.27 m

Question 7

A tourist observes the top of a flagpole at an angle of elevation of 50°. If the horizontal distance is 72 m, find the line of sight distance.



Solution:

Using:
cos θ = Adjacent / Hypotenuse

cos 50° = 72 / Hypotenuse

0.64 = 72 / Hypotenuse

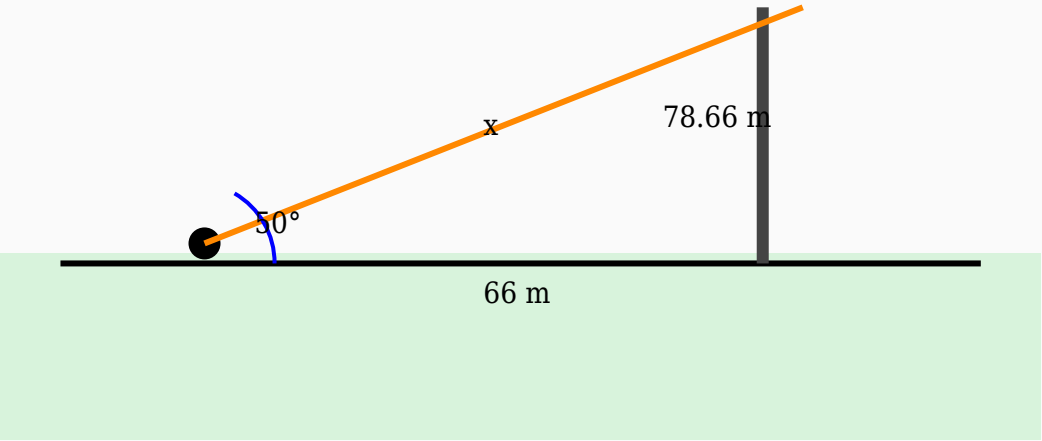
Hypotenuse = 72 / 0.64

Hypotenuse = 112.5 m

Answer: 112.5 m

Question 8

An observer looks at the top of a tower making an angle of elevation of 50°. Determine the length of the line of sight if the horizontal distance is 66 m.



Solution:

Using:
cos θ = Adjacent / Hypotenuse

cos 50° = 66 / Hypotenuse

0.64 = 66 / Hypotenuse

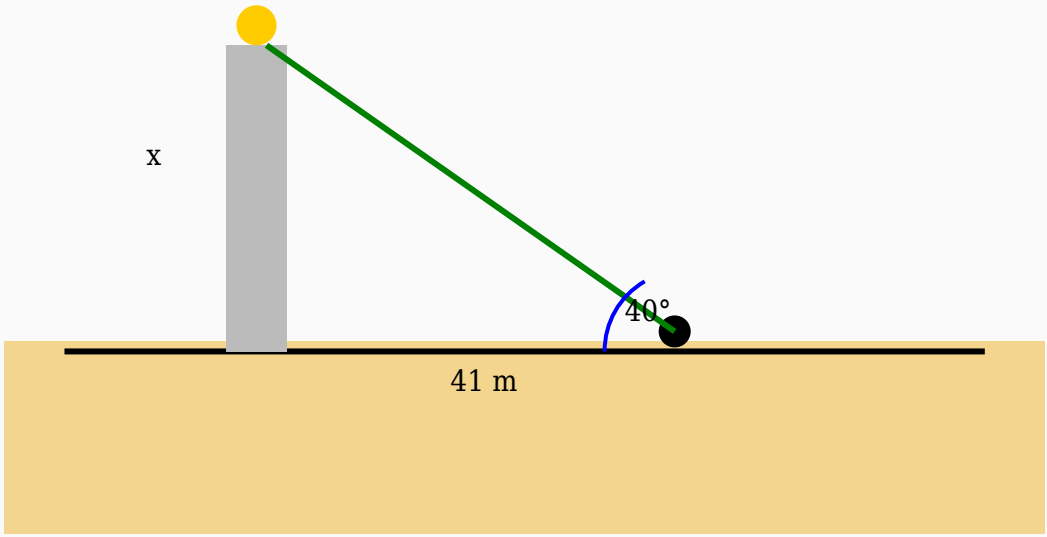
Hypotenuse = 66 / 0.64

Hypotenuse = 103.13 m

Answer: 103.13 m

Question 9

A boy looks at the top of a flagpole at an angle of elevation of 40°. Find the height of the flagpole if the distance from the base is 41 m.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 40° = Height / 41

0.84 = Height / 41

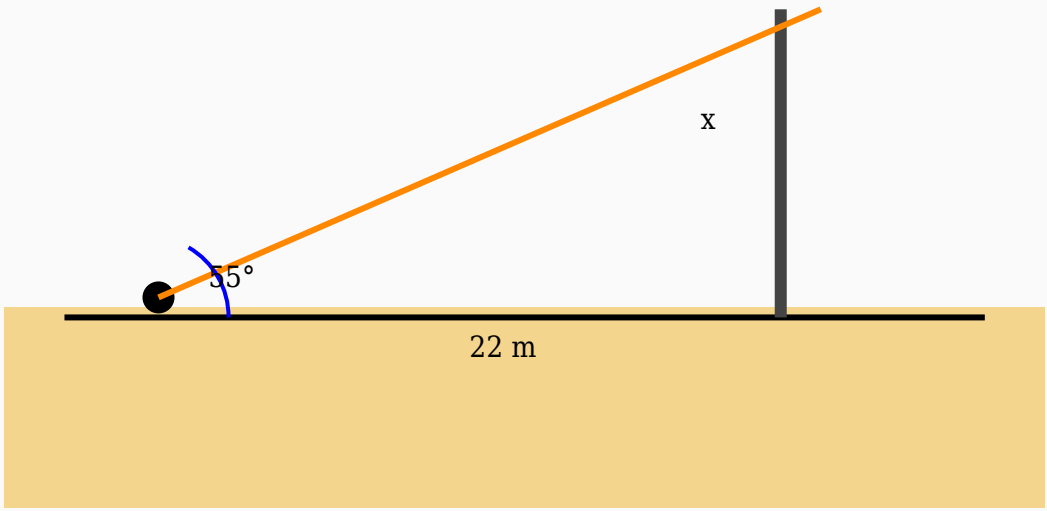
Height = 41 × 0.84

Height = 34.4 m

Answer: 34.4 m

Question 10

A traveller standing near a mountain observes its top at an angle of elevation of 55°. If the horizontal distance is 22 m, find the height of the mountain.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 55° = Height / 22

1.43 = Height / 22

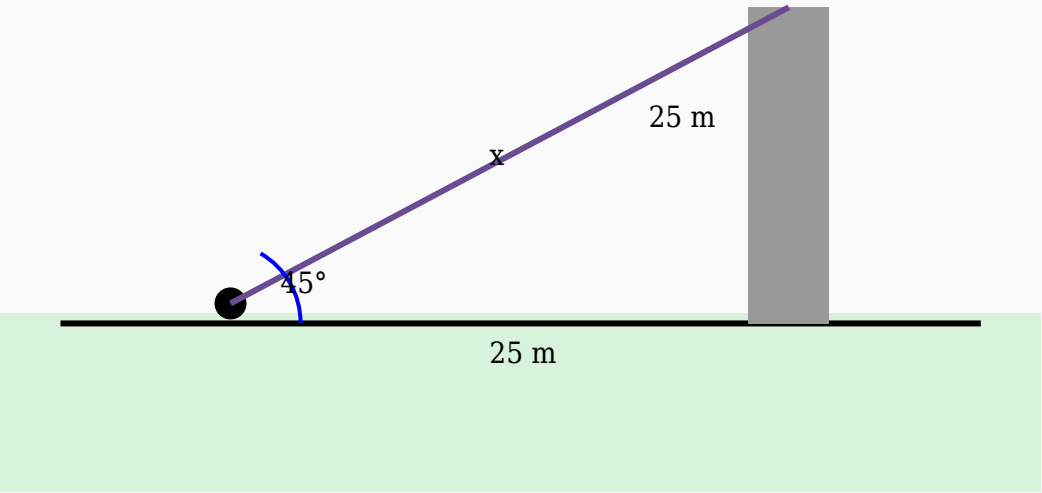
Height = 22 × 1.43

Height = 31.42 m

Answer: 31.42 m

Question 11

An observer looks at the top of a water tank making an angle of elevation of 45°. Determine the length of the line of sight if the horizontal distance is 25 m.



Solution:

Using:
cos θ = Adjacent / Hypotenuse

cos 45° = 25 / Hypotenuse

0.71 = 25 / Hypotenuse

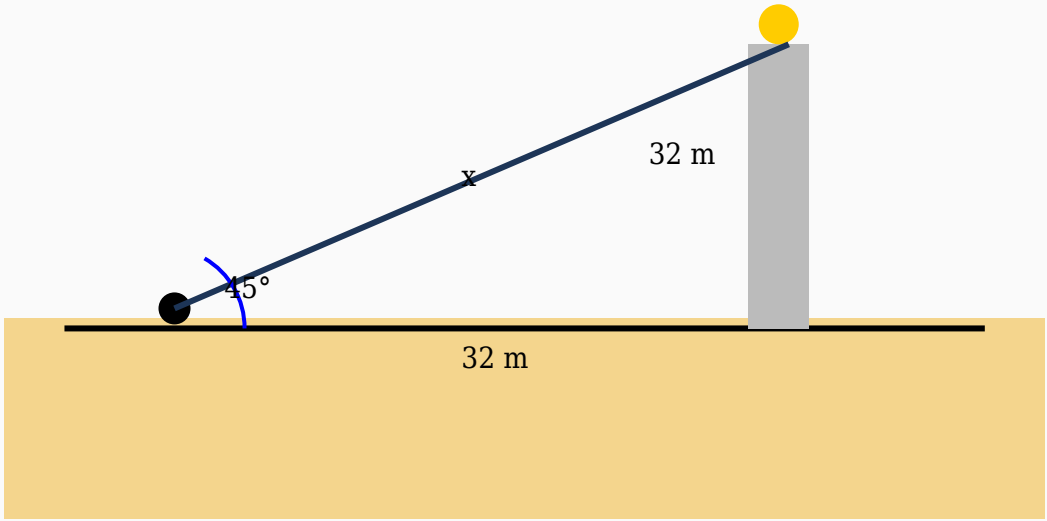
Hypotenuse = 25 / 0.71

Hypotenuse = 35.21 m

Answer: 35.21 m

Question 12

An observer looks at the top of a bridge making an angle of elevation of 45°. Determine the length of the line of sight if the horizontal distance is 32 m.



Solution:

Using:
cos θ = Adjacent / Hypotenuse

cos 45° = 32 / Hypotenuse

0.71 = 32 / Hypotenuse

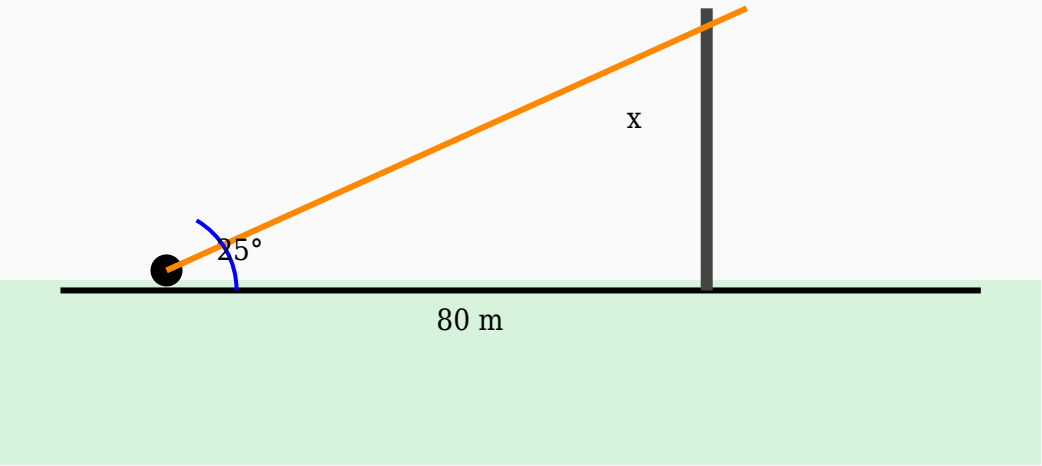
Hypotenuse = 32 / 0.71

Hypotenuse = 45.07 m

Answer: 45.07 m

Question 13

A traveller standing near a tree observes its top at an angle of elevation of 25°. If the horizontal distance is 80 m, find the height of the tree.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 25° = Height / 80

0.47 = Height / 80

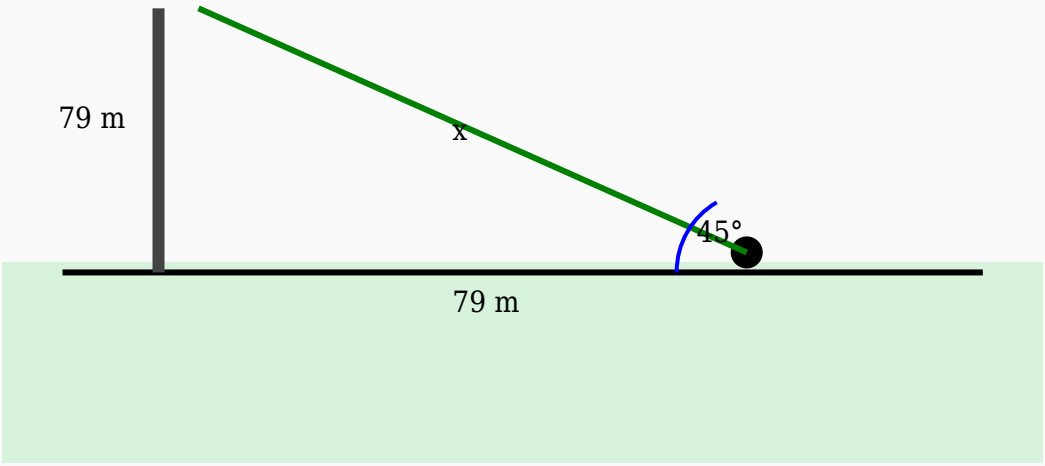
Height = 80 × 0.47

Height = 37.3 m

Answer: 37.3 m

Question 14

The angle of elevation to the top of a tower is 45°. If the observer is 79 m from the base, calculate the hypotenuse.



Solution:

Using:
cos θ = Adjacent / Hypotenuse

cos 45° = 79 / Hypotenuse

0.71 = 79 / Hypotenuse

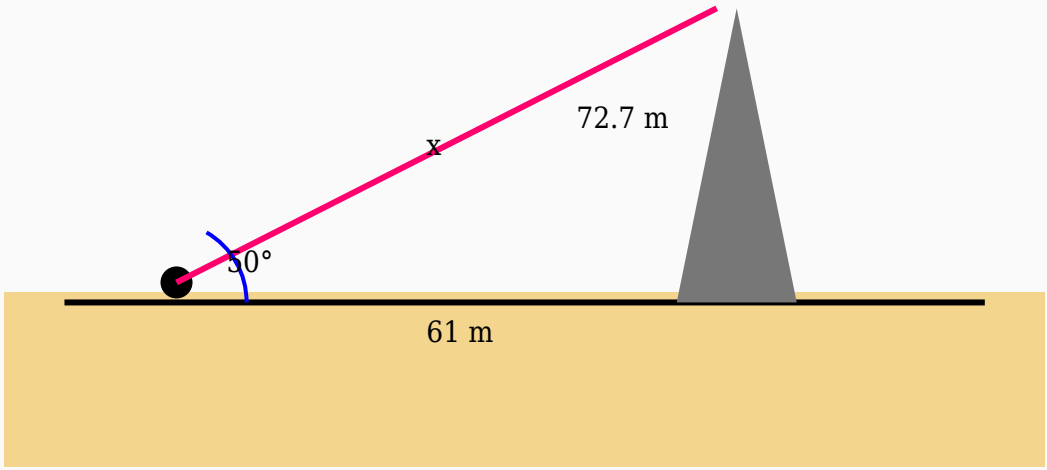
Hypotenuse = 79 / 0.71

Hypotenuse = 111.27 m

Answer: 111.27 m

Question 15

The angle of elevation to the top of a building is 50°. If the observer is 61 m from the base, calculate the hypotenuse.



Solution:

Using:
cos θ = Adjacent / Hypotenuse

cos 50° = 61 / Hypotenuse

0.64 = 61 / Hypotenuse

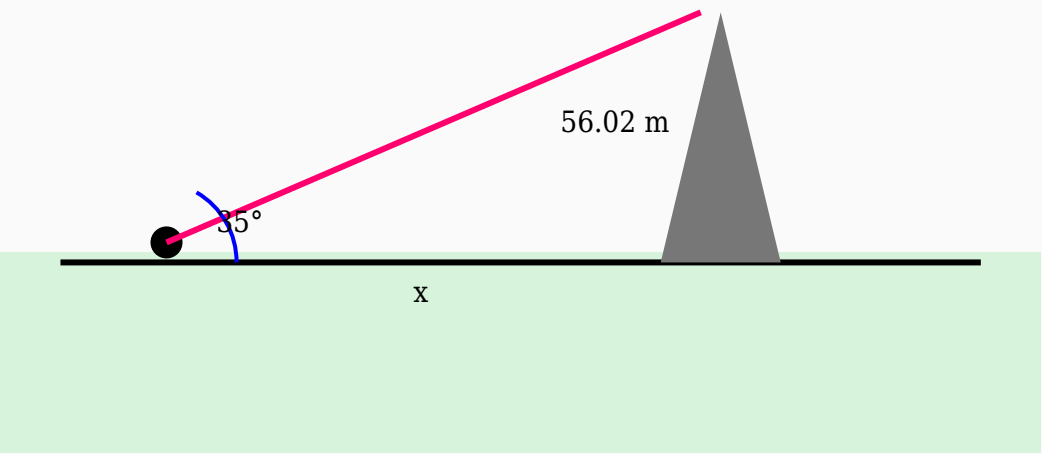
Hypotenuse = 61 / 0.64

Hypotenuse = 95.31 m

Answer: 95.31 m

Question 16

An observer observes the top of a lighthouse at an angle of elevation of 35°. If the height of the lighthouse is 56.02 m, find the horizontal distance.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 35° = 56.02 / Distance

0.7 = 56.02 / Distance

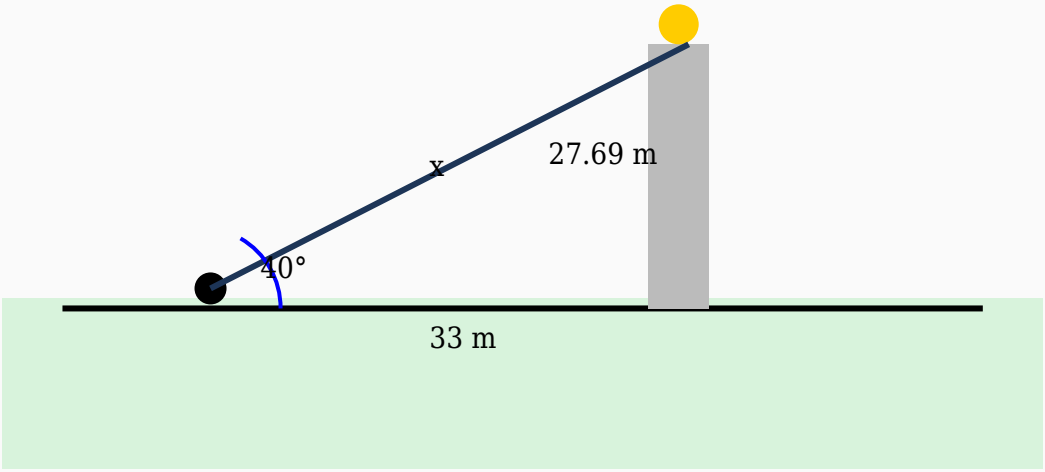
Distance = 56.02 / 0.7

Distance = 80.03 m

Answer: 80.03 m

Question 17

A person standing 33 m away from a watch tower observes its top at an angle of elevation of 40°. Find the line of sight.



Solution:

Using:
cos θ = Adjacent / Hypotenuse

cos 40° = 33 / Hypotenuse

0.77 = 33 / Hypotenuse

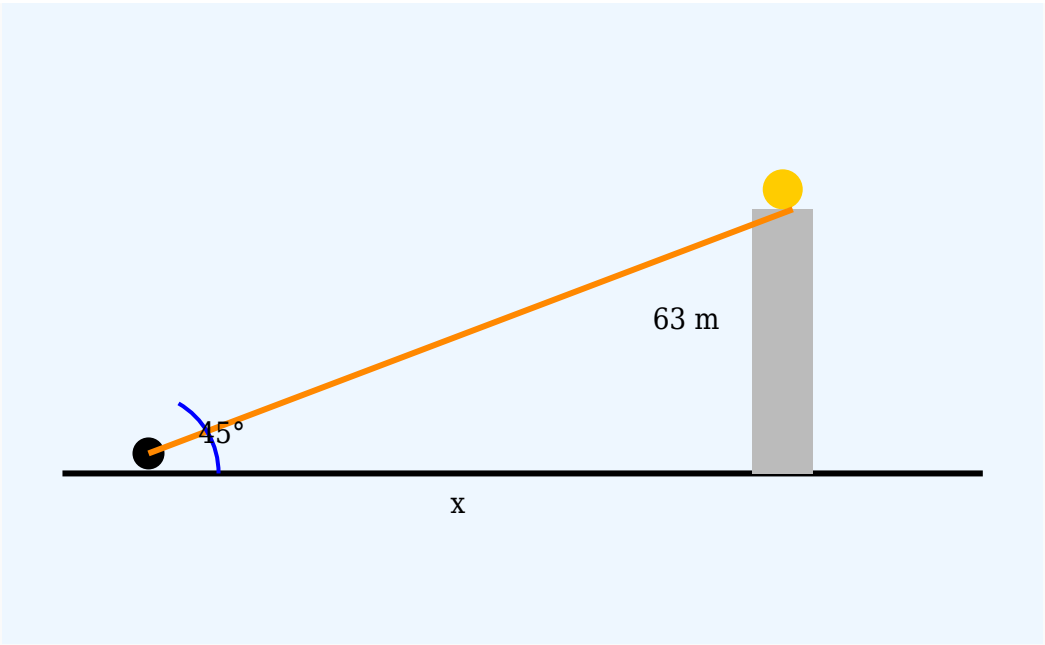
Hypotenuse = 33 / 0.77

Hypotenuse = 42.86 m

Answer: 42.86 m

Question 18

A surveyor observes the top of a mountain at an angle of elevation of 45°. If the height of the mountain is 63 m, find the horizontal distance.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 45° = 63 / Distance

1 = 63 / Distance

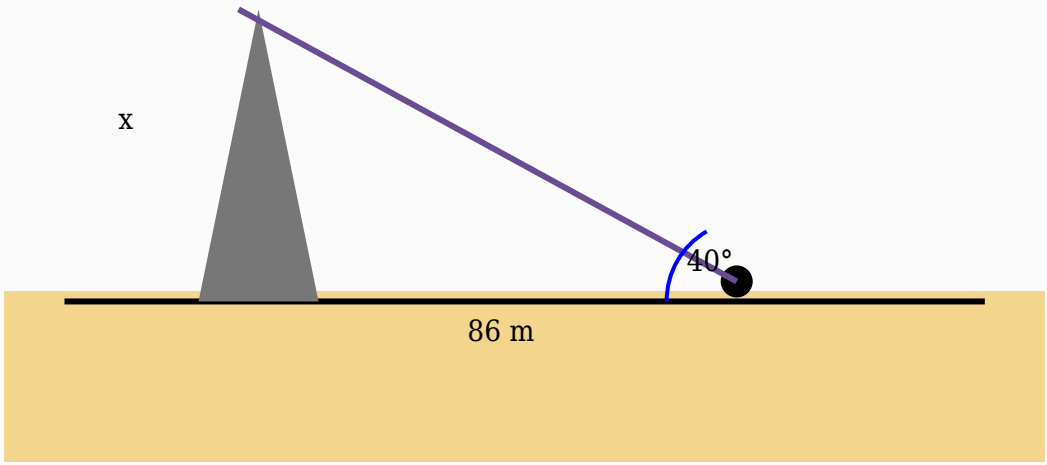
Distance = 63 / 1

Distance = 63 m

Answer: 63 m

Question 19

A girl standing near a water tank observes its top at an angle of elevation of 40°. If the horizontal distance is 86 m, find the height of the water tank.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 40° = Height / 86

0.84 = Height / 86

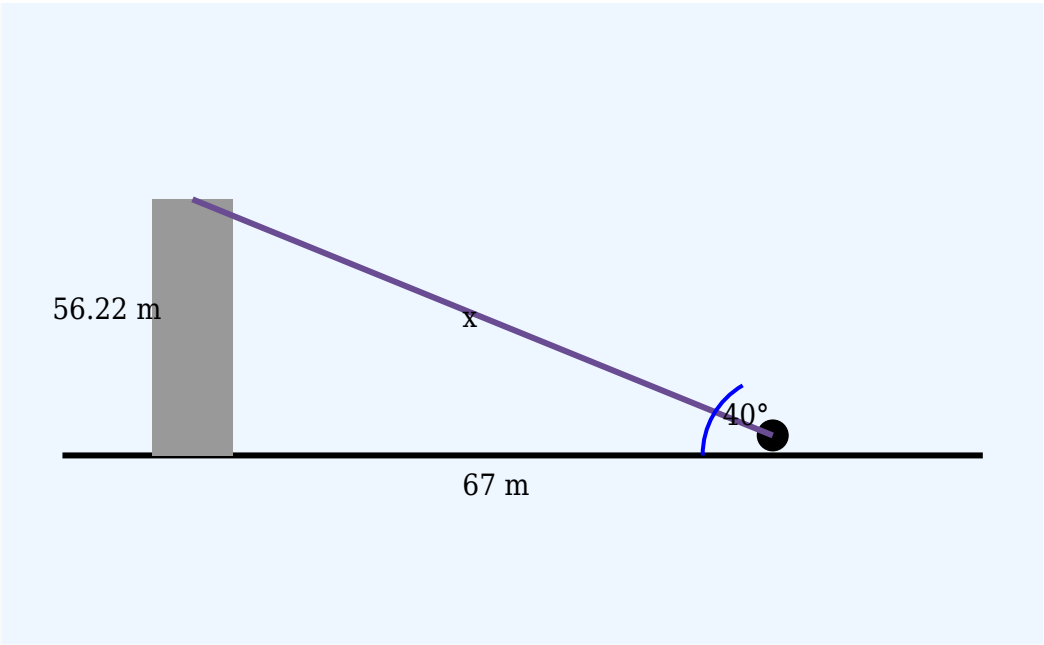
Height = 86 × 0.84

Height = 72.16 m

Answer: 72.16 m

Question 20

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 67 m.



Solution:

Using:
cos θ = Adjacent / Hypotenuse

cos 40° = 67 / Hypotenuse

0.77 = 67 / Hypotenuse

Hypotenuse = 67 / 0.77

Hypotenuse = 87.01 m

Answer: 87.01 m