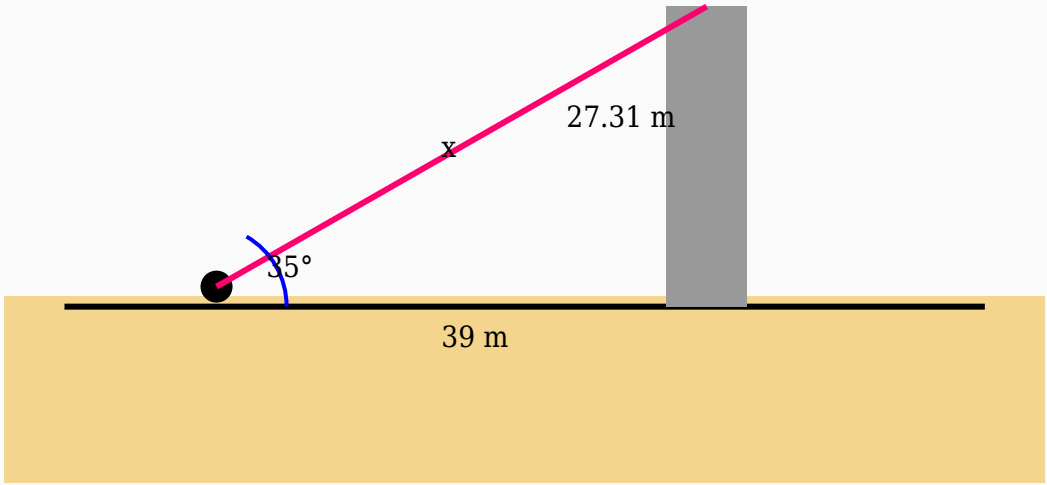
Angle of Elevation Solved Worksheet

Question 1

A person standing 39 m away from a bridge observes its top at an angle of elevation of 35°. Find the line of sight.



Solution:

Using:
cos θ = Adjacent / Hypotenuse

cos 35° = 39 / Hypotenuse

0.82 = 39 / Hypotenuse

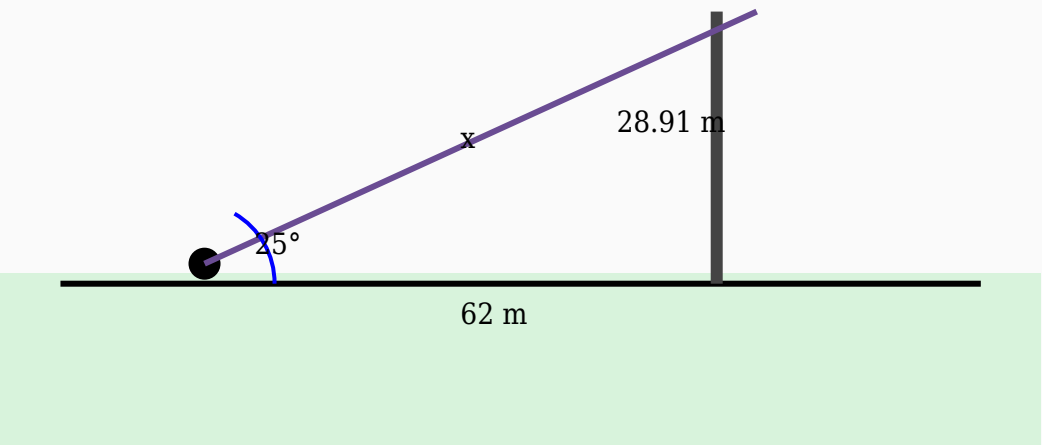
Hypotenuse = 39 / 0.82

Hypotenuse = 47.56 m

Answer: 47.56 m

Question 2

An observer looks at the top of a lighthouse making an angle of elevation of 25°. Determine the length of the line of sight if the horizontal distance is 62 m.



Solution:

Using:
cos θ = Adjacent / Hypotenuse

cos 25° = 62 / Hypotenuse

0.91 = 62 / Hypotenuse

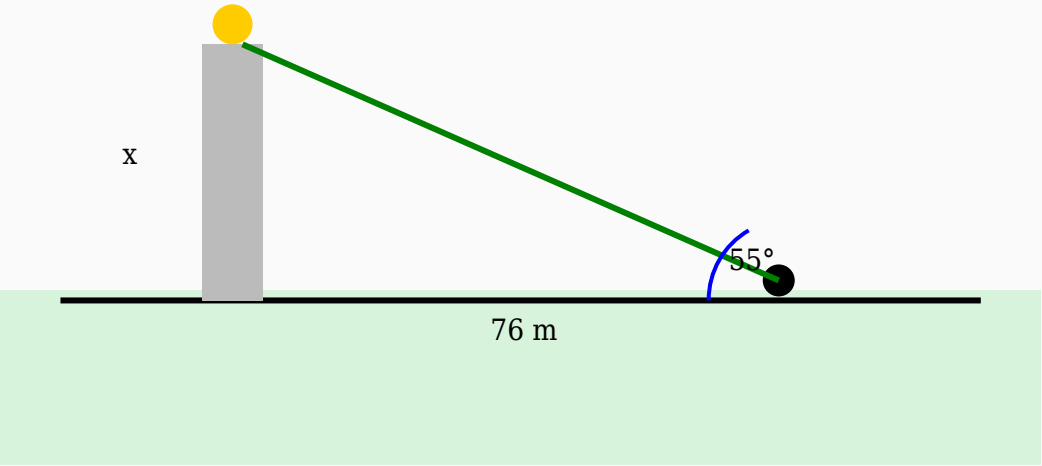
Hypotenuse = 62 / 0.91

Hypotenuse = 68.13 m

Answer: 68.13 m

Question 3

The angle of elevation of the top of a hill from a point on the ground is 55°. If the observer is 76 m away from the hill, calculate its height.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 55° = Height / 76

1.43 = Height / 76

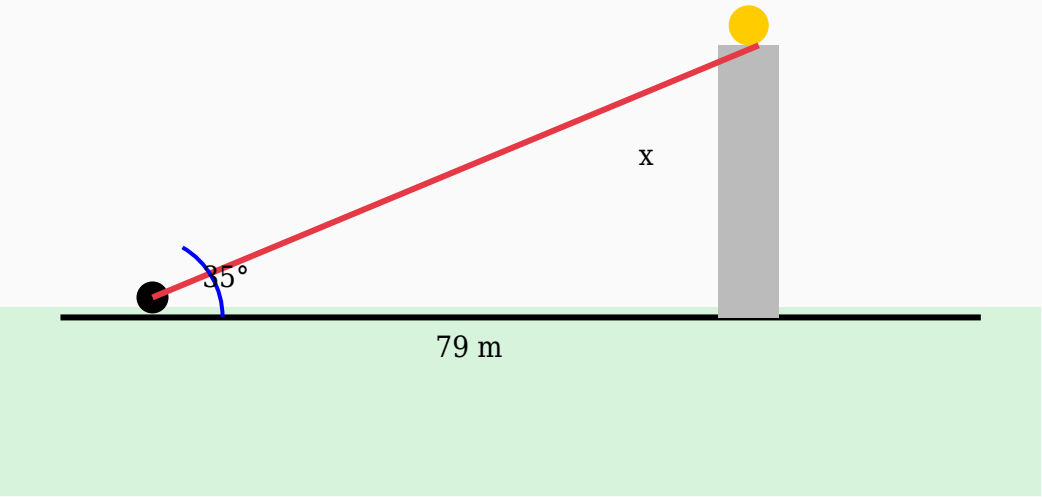
Height = 76 × 1.43

Height = 108.54 m

Answer: 108.54 m

Question 4

The angle of elevation of the top of a bridge from a point on the ground is 35°. If the observer is 79 m away from the bridge, calculate its height.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 35° = Height / 79

0.7 = Height / 79

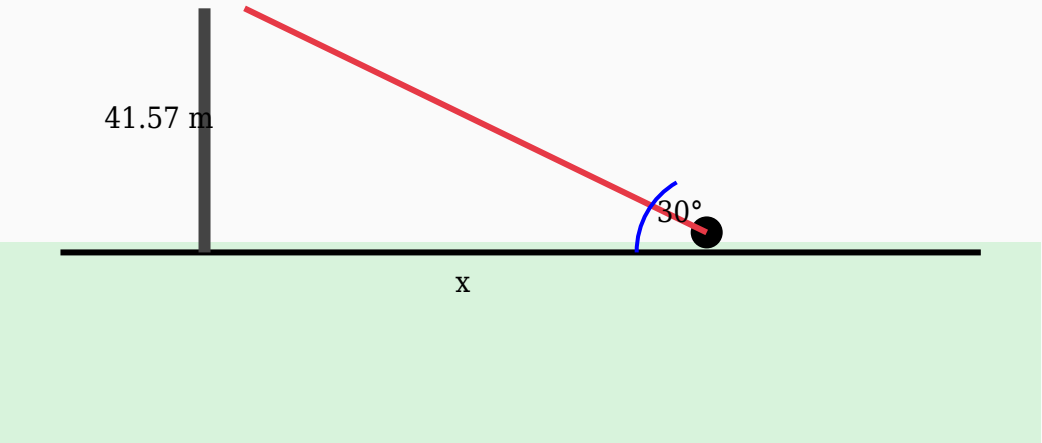
Height = 79 × 0.7

Height = 55.32 m

Answer: 55.32 m

Question 5

The height of a flagpole is 41.57 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° = 41.57 / Distance

0.58 = 41.57 / Distance

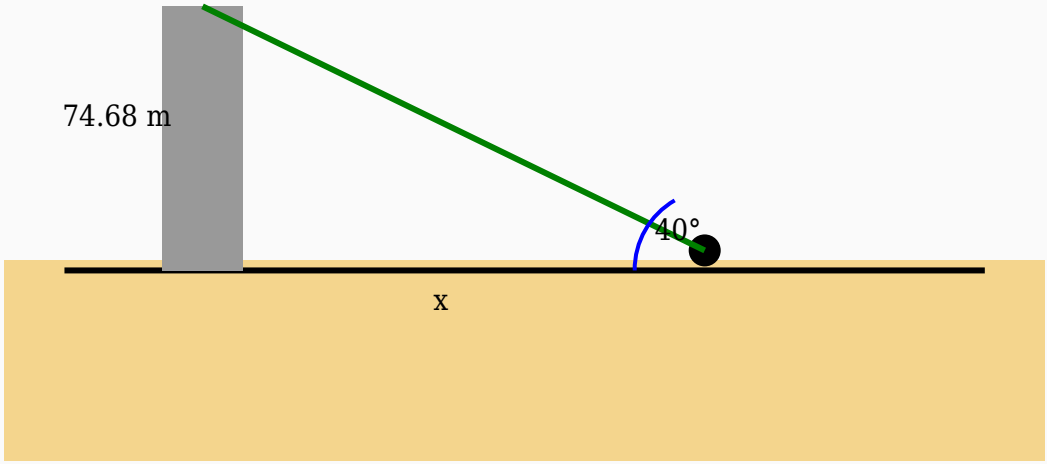
Distance = 41.57 / 0.58

Distance = 71.67 m

Answer: 71.67 m

Question 6

The angle of elevation to the top of a water tank is 40°. Find the distance from the observer to the base if the height is 74.68 m.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 40° = 74.68 / Distance

0.84 = 74.68 / Distance

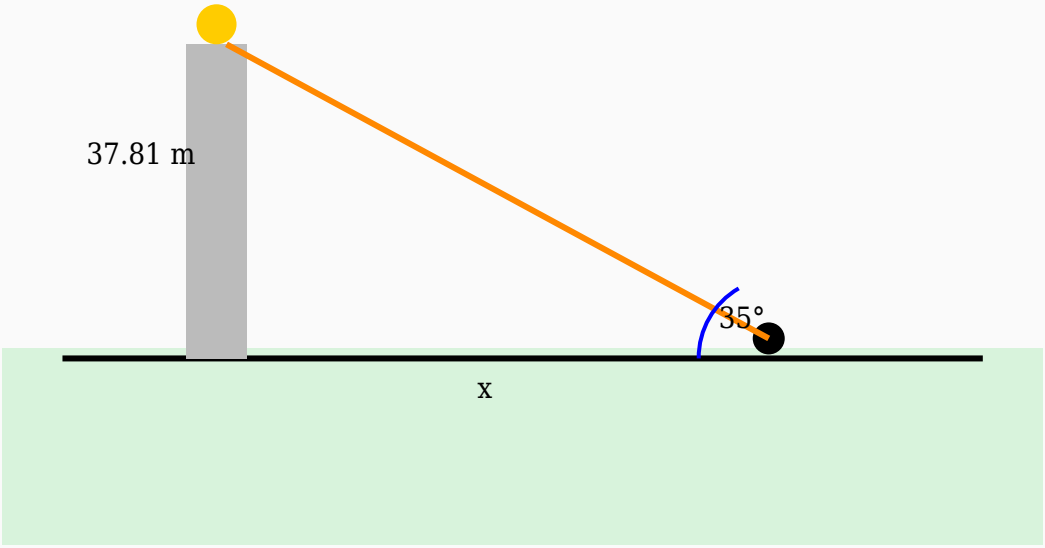
Distance = 74.68 / 0.84

Distance = 88.9 m

Answer: 88.9 m

Question 7

A traveller observes the top of a building at an angle of elevation of 35°. If the height of the building is 37.81 m, find the horizontal distance.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 35° = 37.81 / Distance

0.7 = 37.81 / Distance

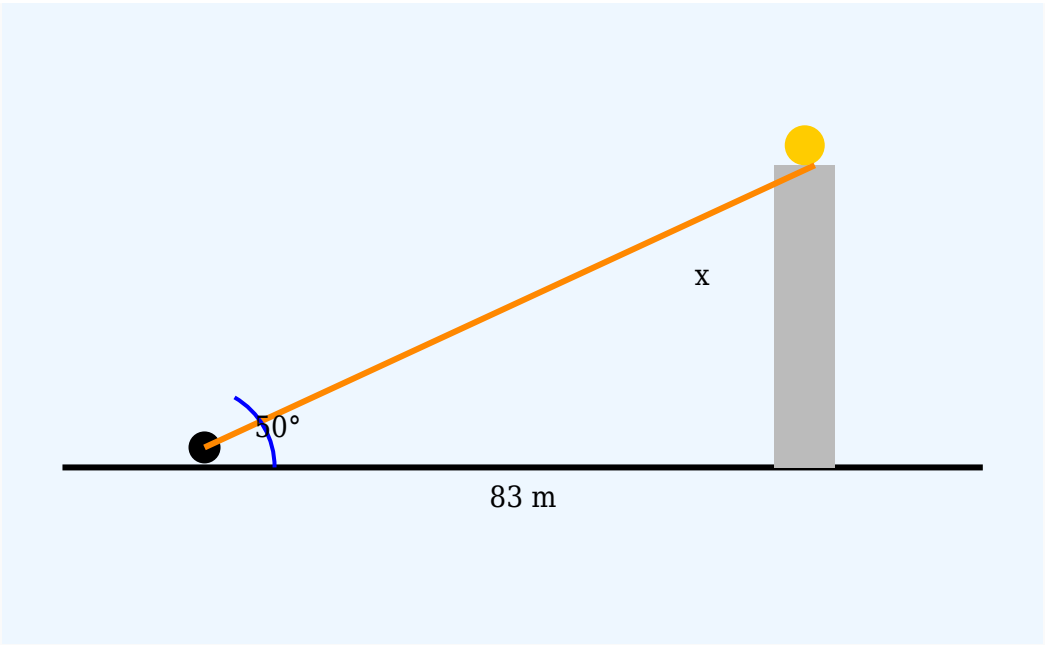
Distance = 37.81 / 0.7

Distance = 54.01 m

Answer: 54.01 m

Question 8

A student standing near a crane observes its top at an angle of elevation of 50°. If the horizontal distance is 83 m, find the height of the crane.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 50° = Height / 83

1.19 = Height / 83

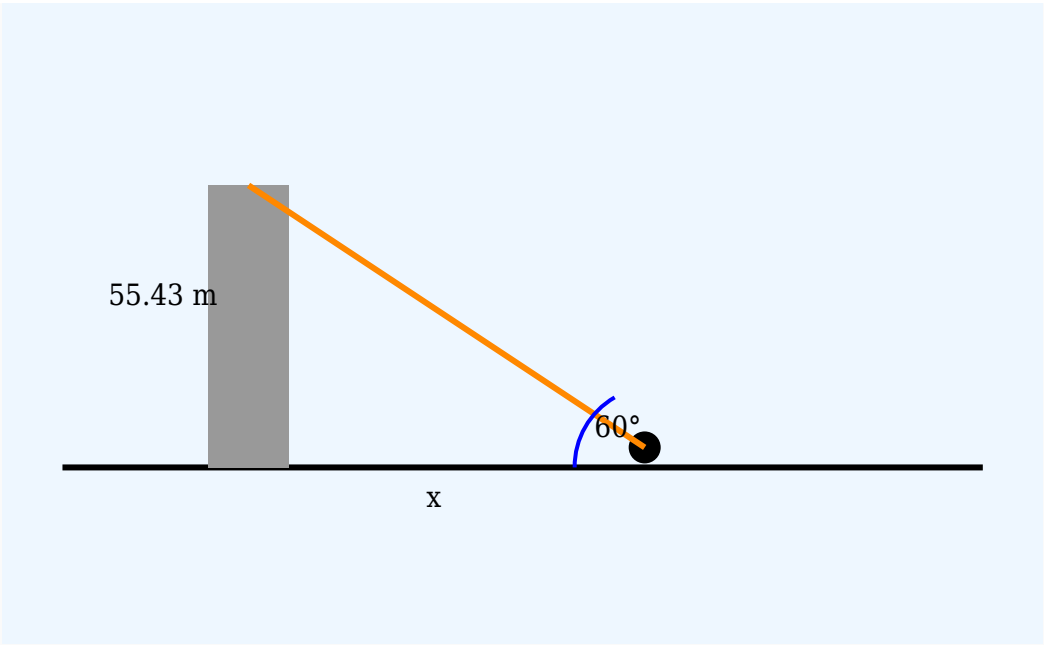
Height = 83 × 1.19

Height = 98.92 m

Answer: 98.92 m

Question 9

The angle of elevation to the top of a watch tower is 60°. Find the distance from the observer to the base if the height is 55.43 m.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 60° = 55.43 / Distance

1.73 = 55.43 / Distance

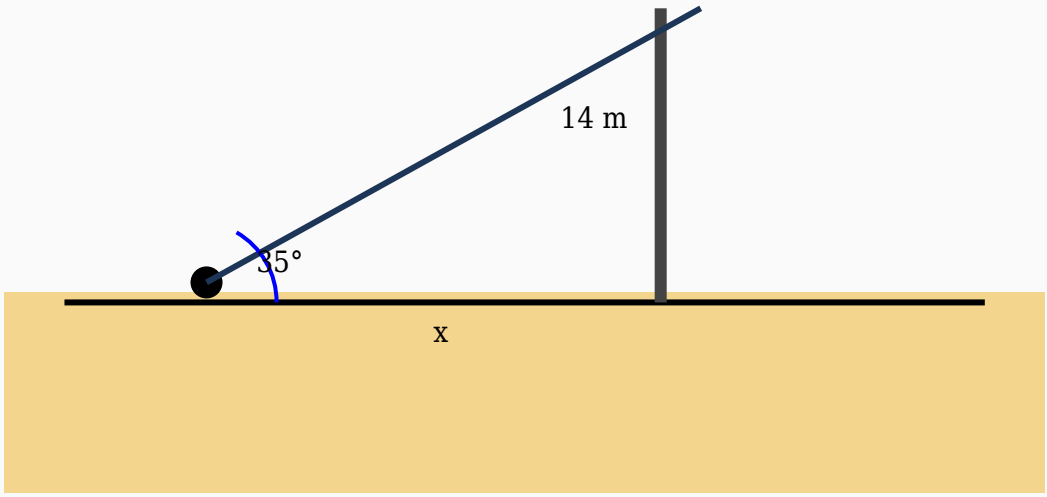
Distance = 55.43 / 1.73

Distance = 32.04 m

Answer: 32.04 m

Question 10

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 14 m.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 35° = 14 / Distance

0.7 = 14 / Distance

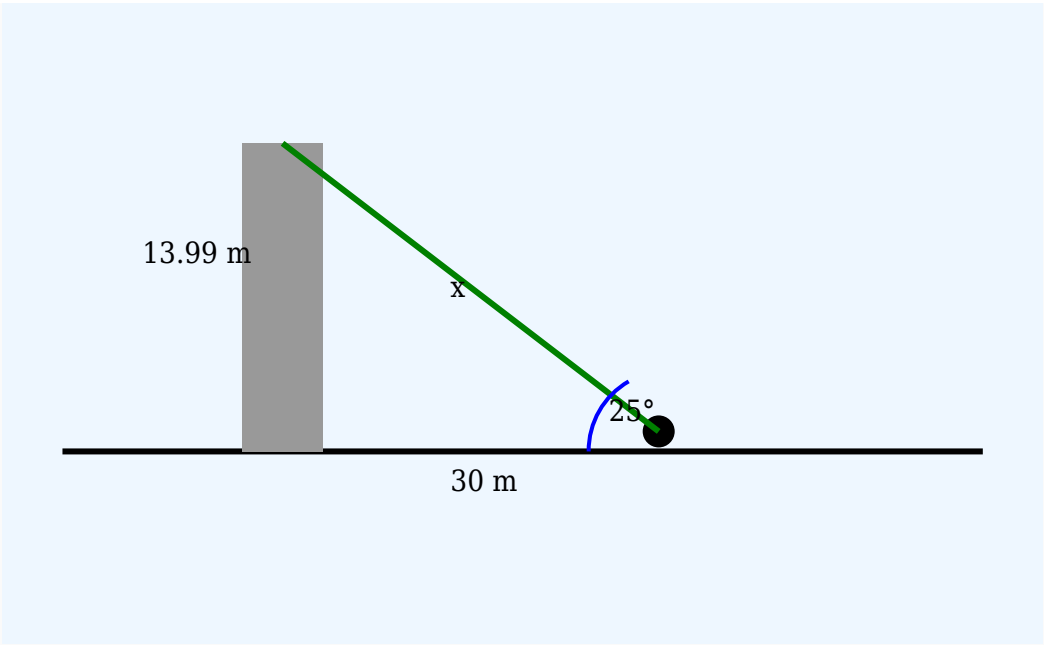
Distance = 14 / 0.7

Distance = 20 m

Answer: 20 m

Question 11

The angle of elevation to the top of a tower is 25°. If the observer is 30 m from the base, calculate the hypotenuse.



Solution:

Using:
cos θ = Adjacent / Hypotenuse

cos 25° = 30 / Hypotenuse

0.91 = 30 / Hypotenuse

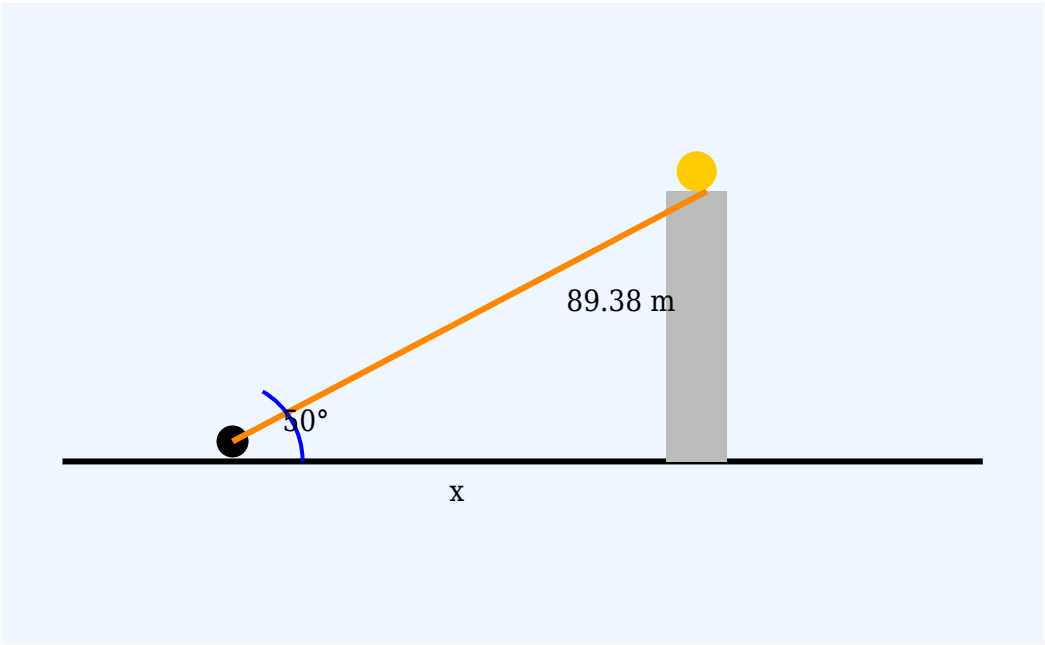
Hypotenuse = 30 / 0.91

Hypotenuse = 32.97 m

Answer: 32.97 m

Question 12

A girl observes the top of a stadium light at an angle of elevation of 50°. If the height of the stadium light is 89.38 m, find the horizontal distance.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 50° = 89.38 / Distance

1.19 = 89.38 / Distance

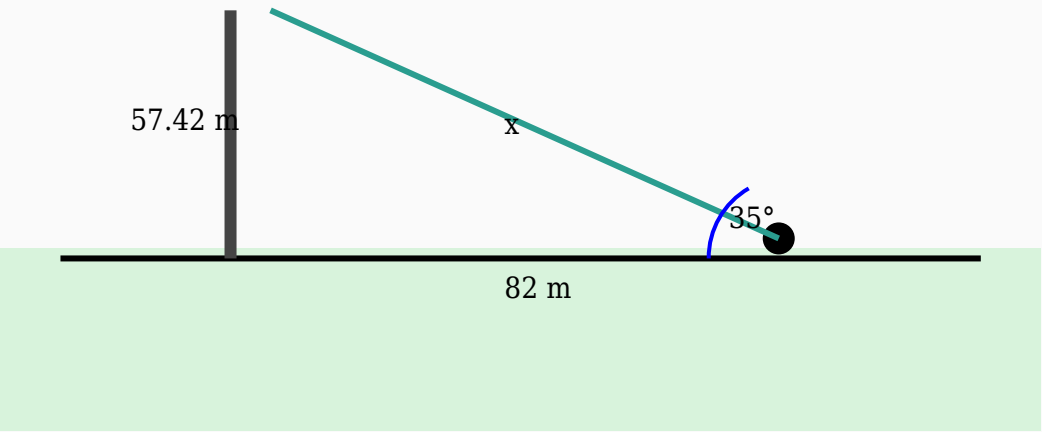
Distance = 89.38 / 1.19

Distance = 75.11 m

Answer: 75.11 m

Question 13

The angle of elevation to the top of a tree is 35°. If the observer is 82 m from the base, calculate the hypotenuse.



Solution:

Using:
cos θ = Adjacent / Hypotenuse

cos 35° = 82 / Hypotenuse

0.82 = 82 / Hypotenuse

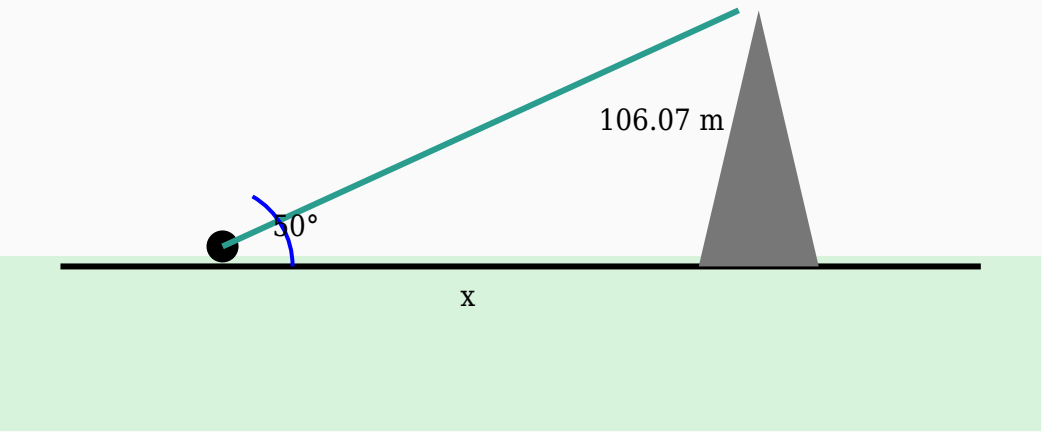
Hypotenuse = 82 / 0.82

Hypotenuse = 100 m

Answer: 100 m

Question 14

The height of a watch tower is 106.07 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° = 106.07 / Distance

1.19 = 106.07 / Distance

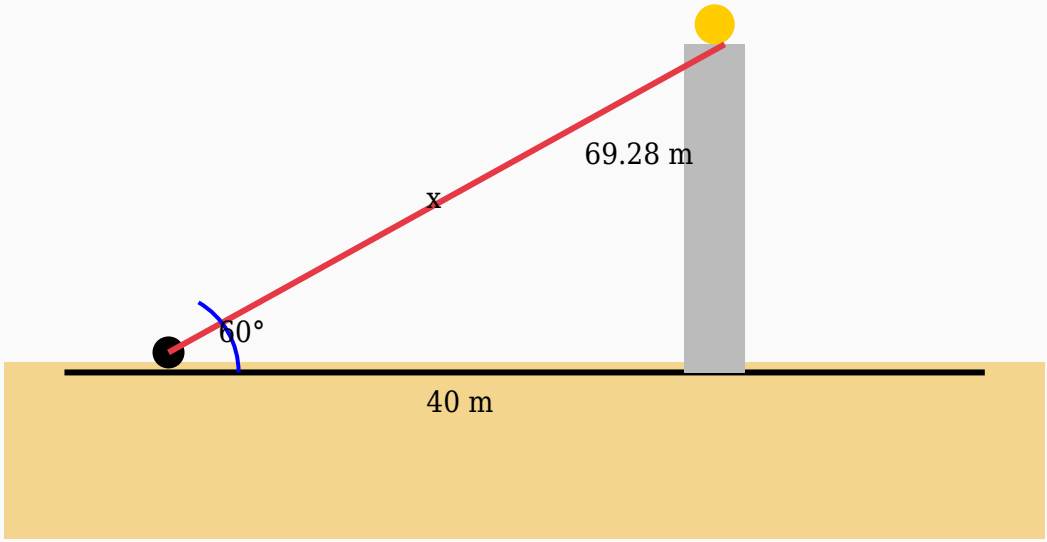
Distance = 106.07 / 1.19

Distance = 89.13 m

Answer: 89.13 m

Question 15

A woman observes the top of a mountain at an angle of elevation of 60°. If the horizontal distance is 40 m, find the line of sight distance.



Solution:

Using:
cos θ = Adjacent / Hypotenuse

cos 60° = 40 / Hypotenuse

0.5 = 40 / Hypotenuse

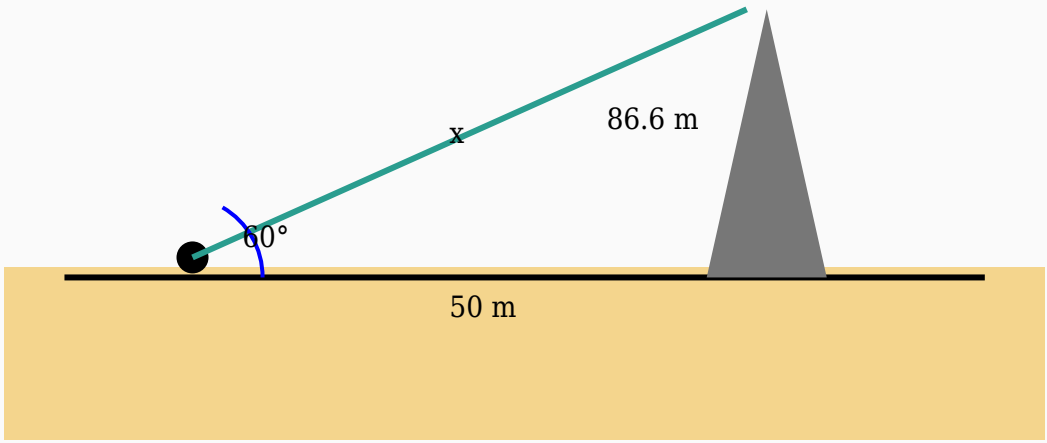
Hypotenuse = 40 / 0.5

Hypotenuse = 80 m

Answer: 80 m

Question 16

An observer looks at the top of a stadium light making an angle of elevation of 60°. Determine the length of the line of sight if the horizontal distance is 50 m.



Solution:

Using:
cos θ = Adjacent / Hypotenuse

cos 60° = 50 / Hypotenuse

0.5 = 50 / Hypotenuse

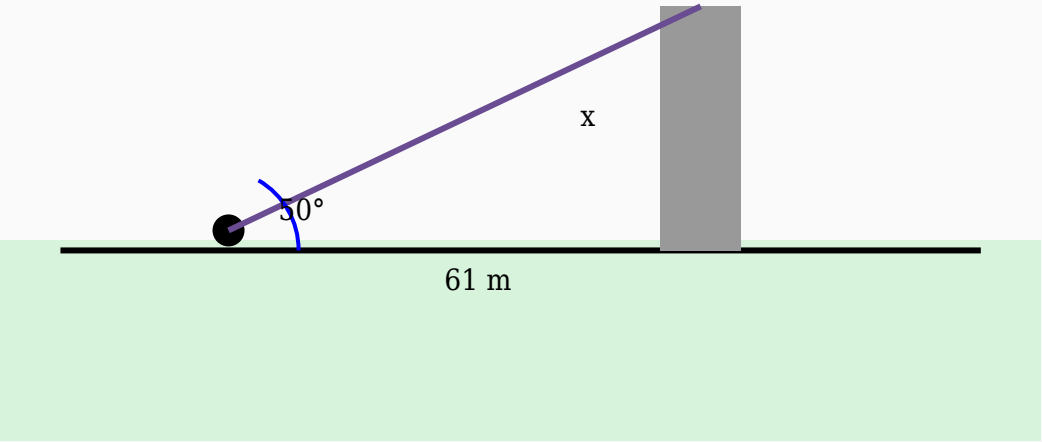
Hypotenuse = 50 / 0.5

Hypotenuse = 100 m

Answer: 100 m

Question 17

A traveller standing near a tree observes its top at an angle of elevation of 50°. If the horizontal distance is 61 m, find the height of the tree.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 50° = Height / 61

1.19 = Height / 61

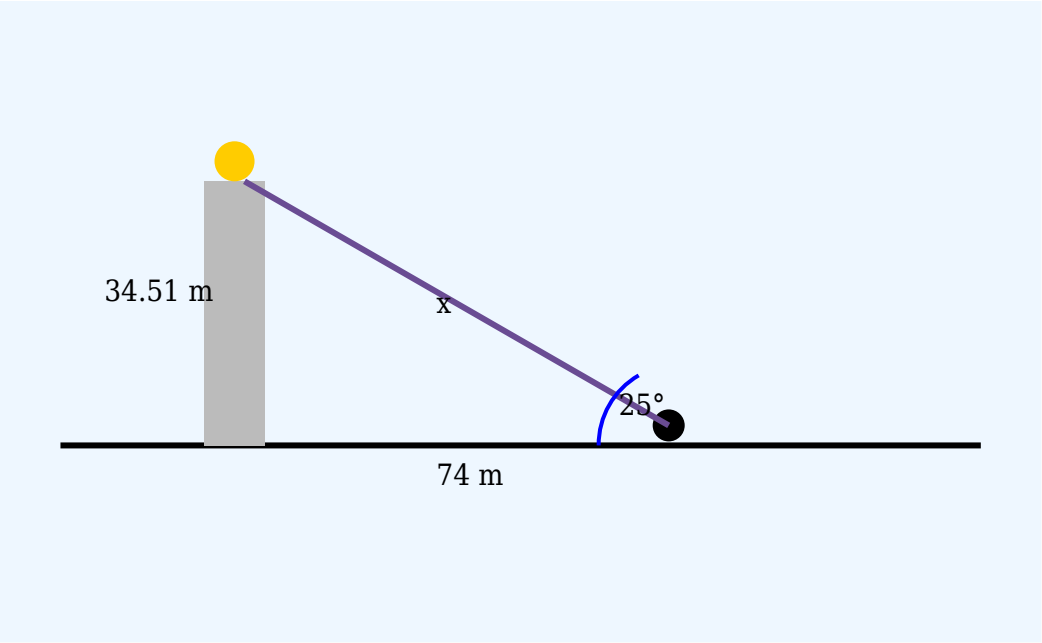
Height = 61 × 1.19

Height = 72.7 m

Answer: 72.7 m

Question 18

The angle of elevation to the top of a crane is 25°. If the observer is 74 m from the base, calculate the hypotenuse.



Solution:

Using:
cos θ = Adjacent / Hypotenuse

cos 25° = 74 / Hypotenuse

0.91 = 74 / Hypotenuse

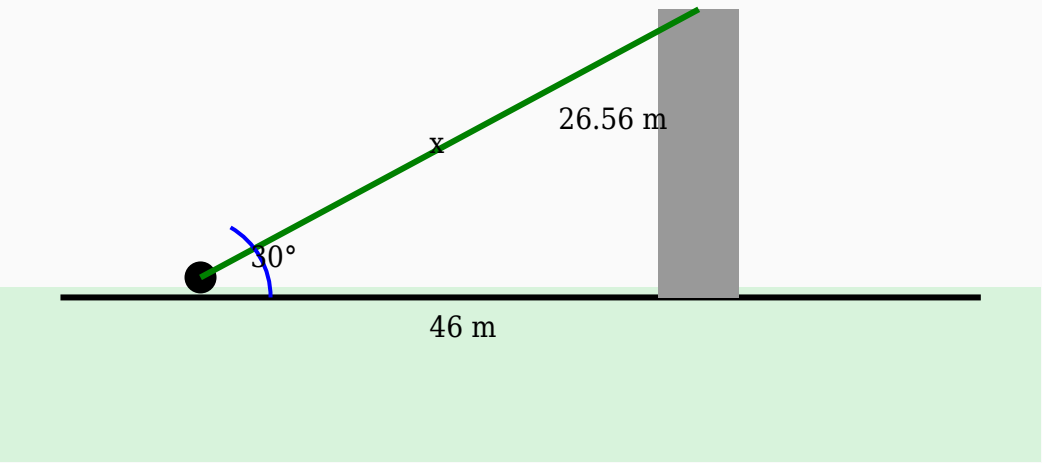
Hypotenuse = 74 / 0.91

Hypotenuse = 81.32 m

Answer: 81.32 m

Question 19

The angle of elevation to the top of a mountain is 30°. If the observer is 46 m from the base, calculate the hypotenuse.



Solution:

Using:
cos θ = Adjacent / Hypotenuse

cos 30° = 46 / Hypotenuse

0.87 = 46 / Hypotenuse

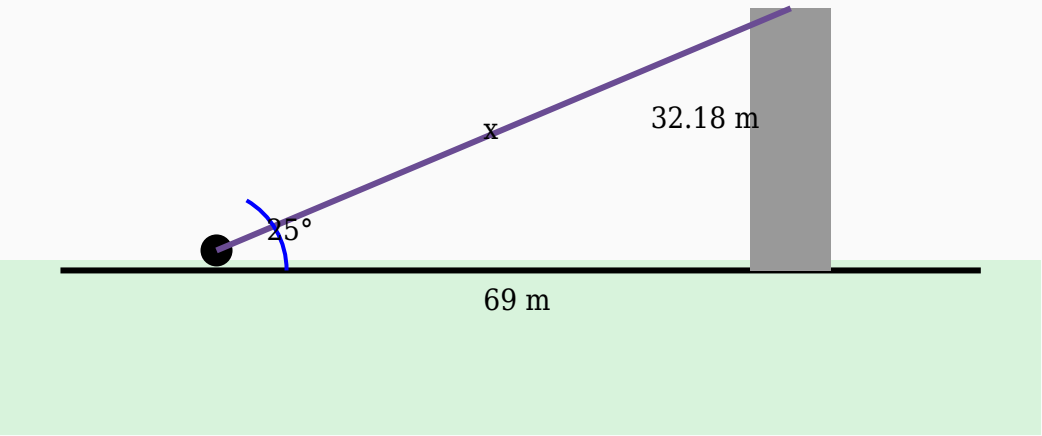
Hypotenuse = 46 / 0.87

Hypotenuse = 52.87 m

Answer: 52.87 m

Question 20

A person standing 69 m away from a crane observes its top at an angle of elevation of 25°. Find the line of sight.



Solution:

Using:
cos θ = Adjacent / Hypotenuse

cos 25° = 69 / Hypotenuse

0.91 = 69 / Hypotenuse

Hypotenuse = 69 / 0.91

Hypotenuse = 75.82 m

Answer: 75.82 m