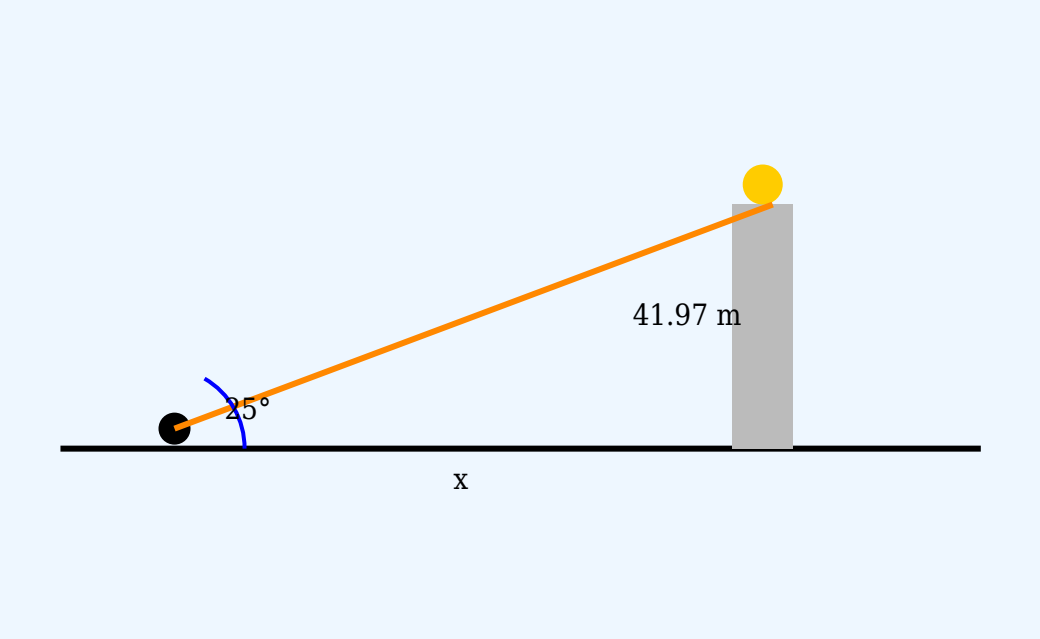
Angle of Elevation Solved Worksheet

Question 1

A surveyor notices the top of a electric pole at an angle of elevation of 25°. Determine the horizontal distance if the height of the electric pole is 41.97 m.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 25° = 41.97 / Distance

0.47 = 41.97 / Distance

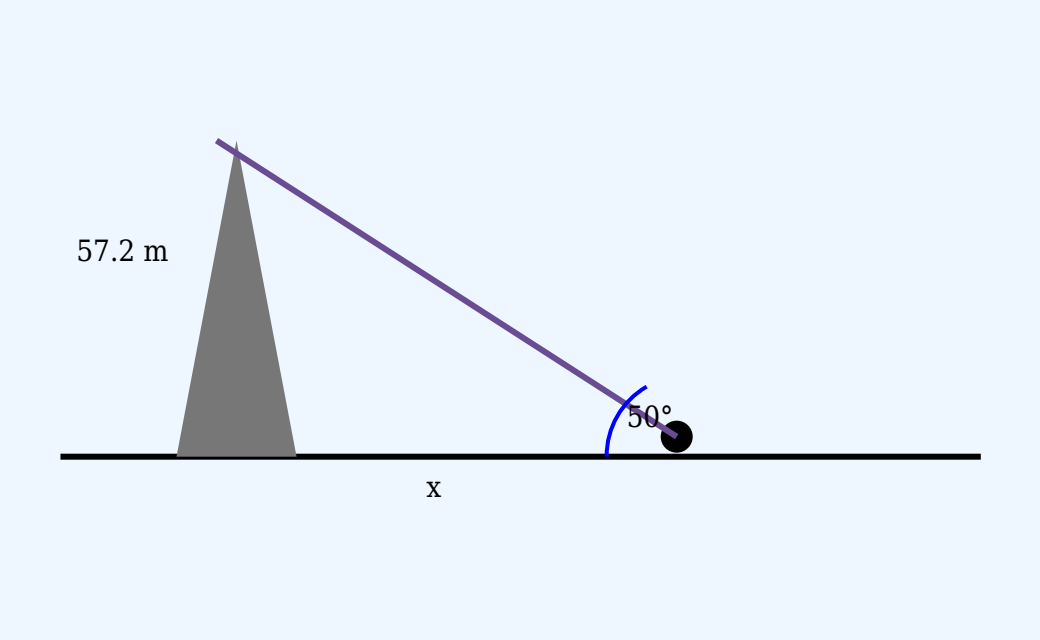
Distance = 41.97 / 0.47

Distance = 89.3 m

Answer: 89.3 m

Question 2

The angle of elevation to the top of a bridge is 50°. Find the distance from the observer to the base if the height is 57.2 m.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 50° = 57.2 / Distance

1.19 = 57.2 / Distance

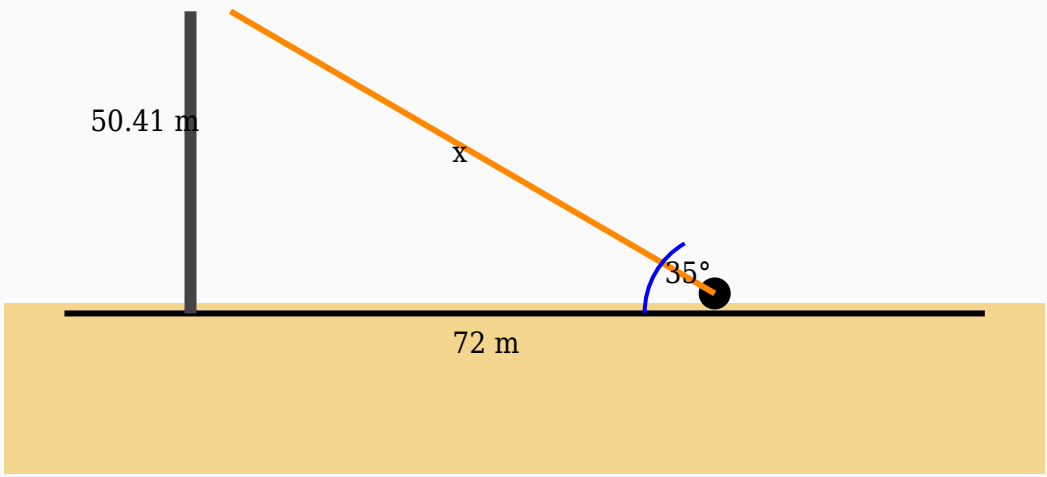
Distance = 57.2 / 1.19

Distance = 48.07 m

Answer: 48.07 m

Question 3

An observer looks at the top of a flagpole making an angle of elevation of 35°. Determine the length of the line of sight if the horizontal distance is 72 m.



Solution:

Using:
cos θ = Adjacent / Hypotenuse

cos 35° = 72 / Hypotenuse

0.82 = 72 / Hypotenuse

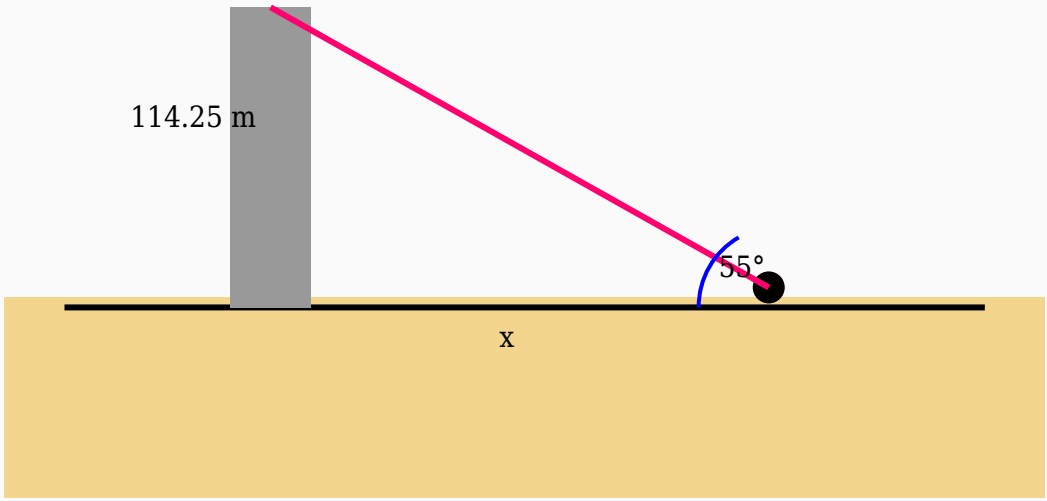
Hypotenuse = 72 / 0.82

Hypotenuse = 87.8 m

Answer: 87.8 m

Question 4

A photographer observes the top of a water tank at an angle of elevation of 55°. If the height of the water tank is 114.25 m, find the horizontal distance.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 55° = 114.25 / Distance

1.43 = 114.25 / Distance

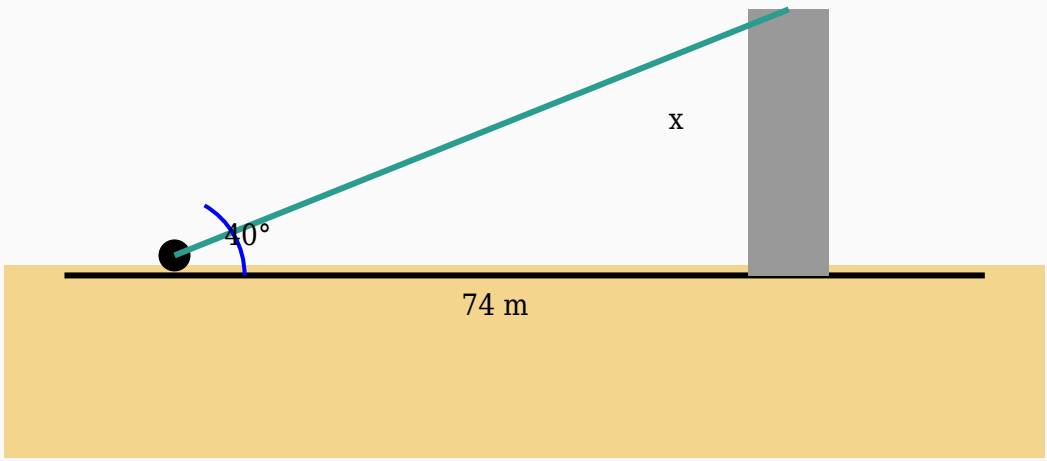
Distance = 114.25 / 1.43

Distance = 79.9 m

Answer: 79.9 m

Question 5

A surveyor looks at the top of a electric pole at an angle of elevation of 40°. Find the height of the electric pole if the distance from the base is 74 m.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 40° = Height / 74

0.84 = Height / 74

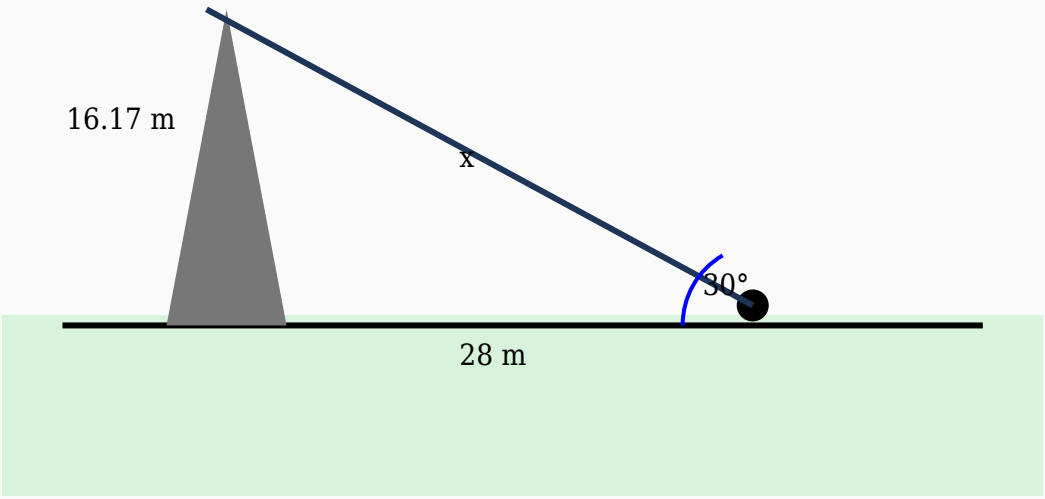
Height = 74 × 0.84

Height = 62.09 m

Answer: 62.09 m

Question 6

A student observes the top of a watch tower at an angle of elevation of 30°. If the horizontal distance is 28 m, find the line of sight distance.



Solution:

Using:
cos θ = Adjacent / Hypotenuse

cos 30° = 28 / Hypotenuse

0.87 = 28 / Hypotenuse

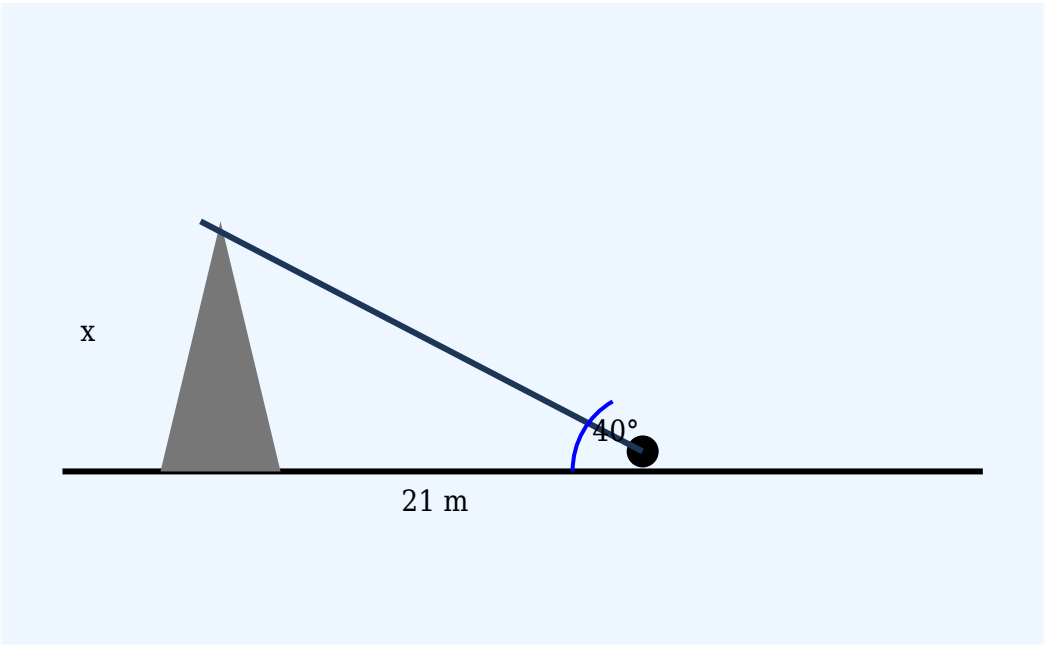
Hypotenuse = 28 / 0.87

Hypotenuse = 32.18 m

Answer: 32.18 m

Question 7

The angle of elevation of the top of a tower from a point on the ground is 40°. If the observer is 21 m away from the tower, calculate its height.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 40° = Height / 21

0.84 = Height / 21

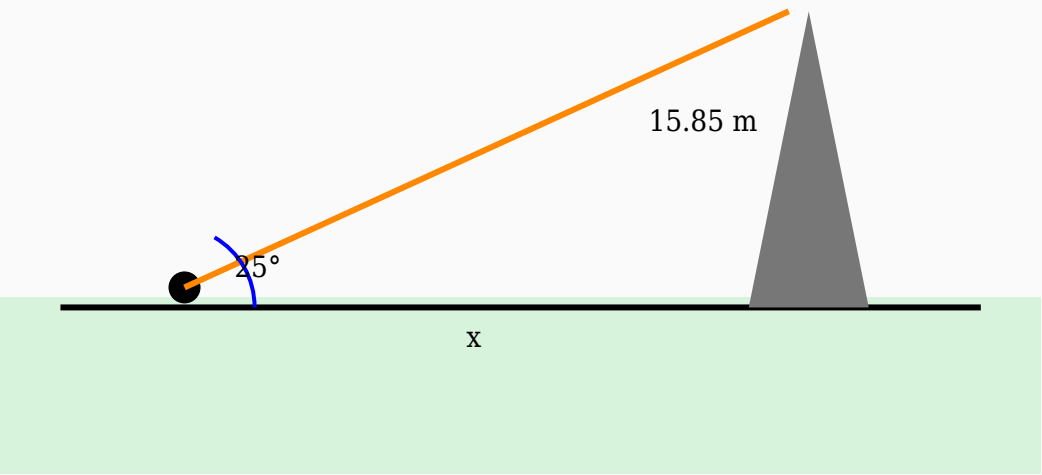
Height = 21 × 0.84

Height = 17.62 m

Answer: 17.62 m

Question 8

A surveyor notices the top of a bridge at an angle of elevation of 25°. Determine the horizontal distance if the height of the bridge is 15.85 m.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 25° = 15.85 / Distance

0.47 = 15.85 / Distance

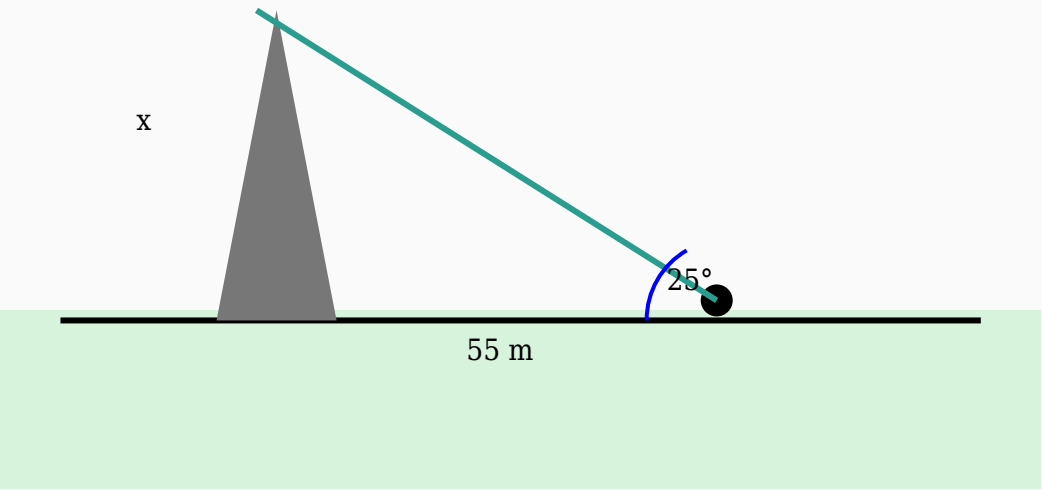
Distance = 15.85 / 0.47

Distance = 33.72 m

Answer: 33.72 m

Question 9

A photographer standing near a tower observes its top at an angle of elevation of 25°. If the horizontal distance is 55 m, find the height of the tower.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 25° = Height / 55

0.47 = Height / 55

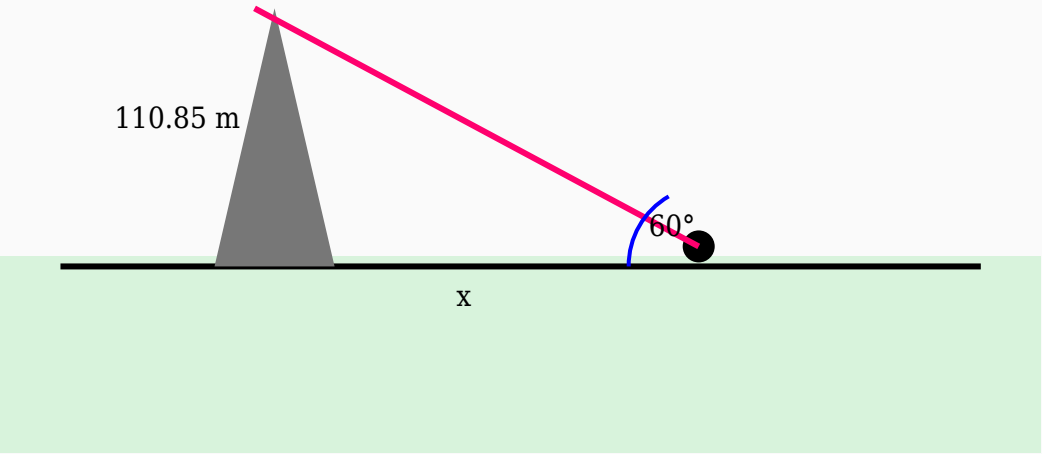
Height = 55 × 0.47

Height = 25.65 m

Answer: 25.65 m

Question 10

The height of a hill is 110.85 m. If the angle of elevation from a point on the ground is 60°, calculate the horizontal distance.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 60° = 110.85 / Distance

1.73 = 110.85 / Distance

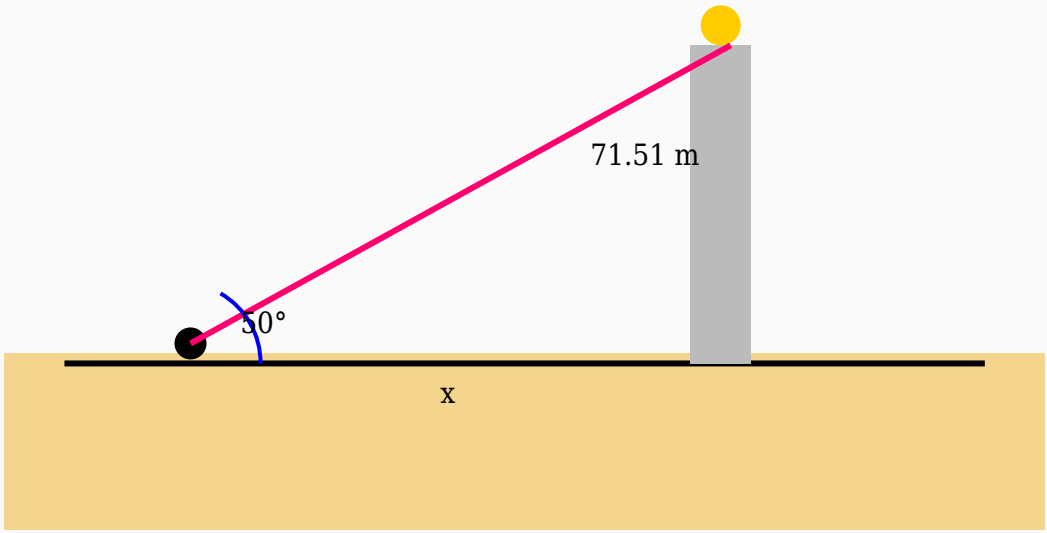
Distance = 110.85 / 1.73

Distance = 64.08 m

Answer: 64.08 m

Question 11

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 71.51 m.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 50° = 71.51 / Distance

1.19 = 71.51 / Distance

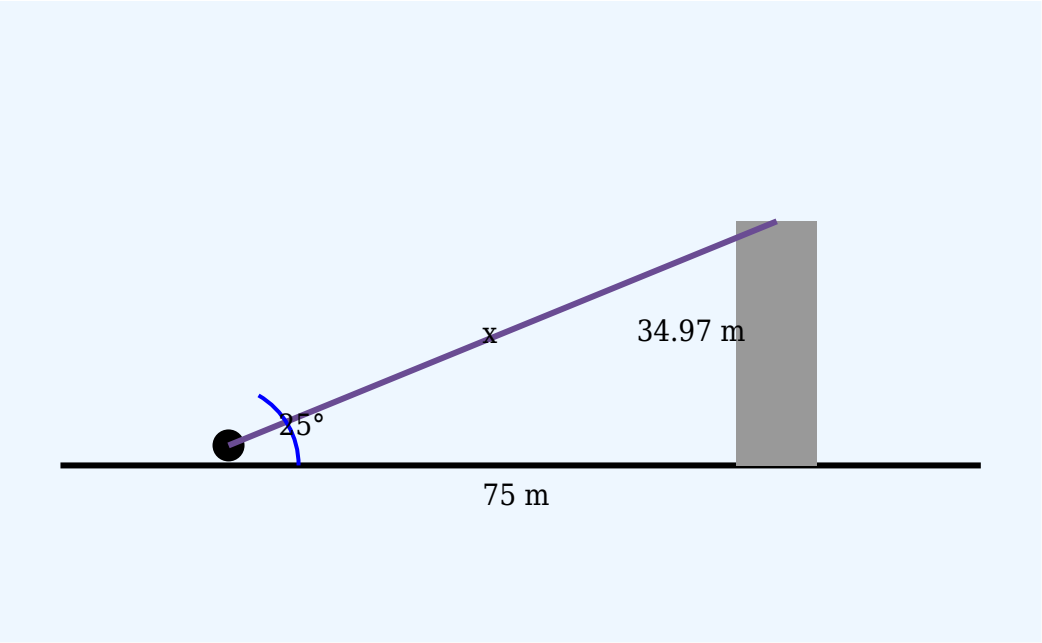
Distance = 71.51 / 1.19

Distance = 60.09 m

Answer: 60.09 m

Question 12

A surveyor observes the top of a watch tower at an angle of elevation of 25°. If the horizontal distance is 75 m, find the line of sight distance.



Solution:

Using:
cos θ = Adjacent / Hypotenuse

cos 25° = 75 / Hypotenuse

0.91 = 75 / Hypotenuse

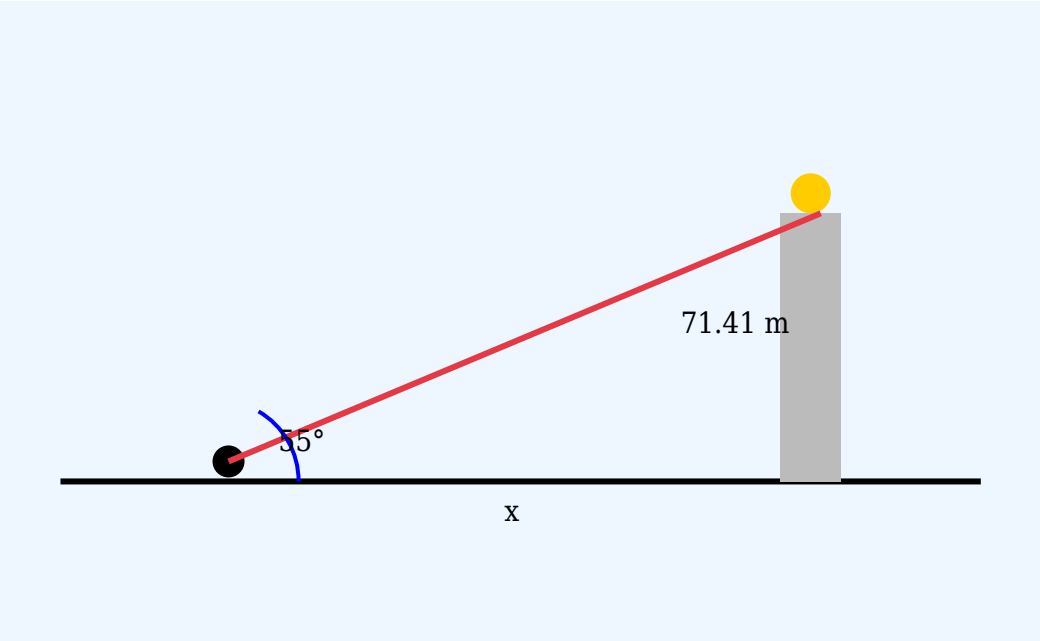
Hypotenuse = 75 / 0.91

Hypotenuse = 82.42 m

Answer: 82.42 m

Question 13

A surveyor observes the top of a stadium light at an angle of elevation of 55°. If the height of the stadium light is 71.41 m, find the horizontal distance.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 55° = 71.41 / Distance

1.43 = 71.41 / Distance

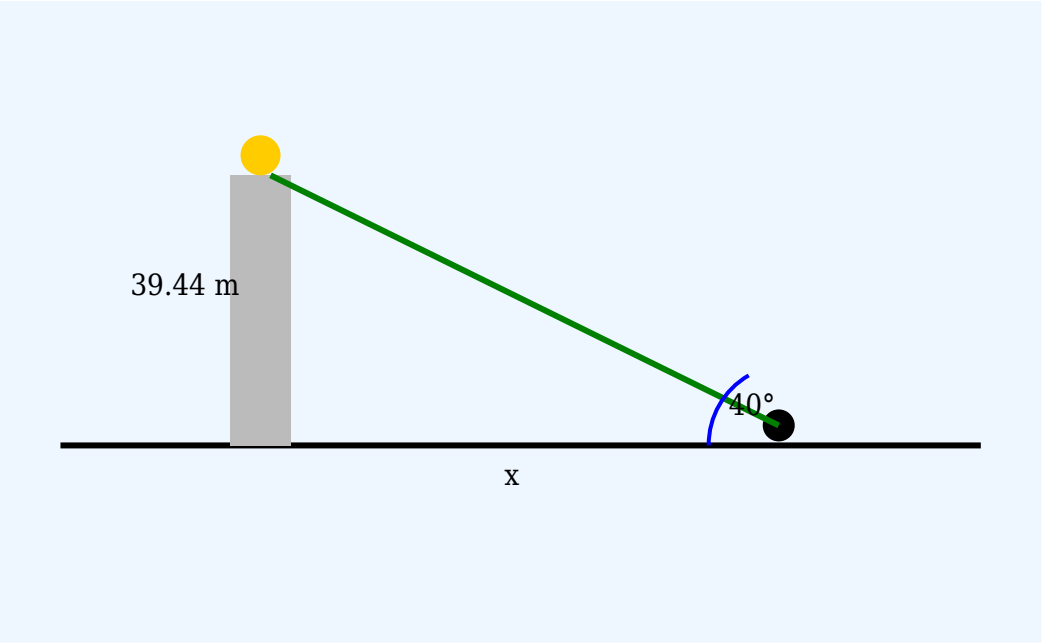
Distance = 71.41 / 1.43

Distance = 49.94 m

Answer: 49.94 m

Question 14

The angle of elevation to the top of a electric pole is 40°. Find the distance from the observer to the base if the height is 39.44 m.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 40° = 39.44 / Distance

0.84 = 39.44 / Distance

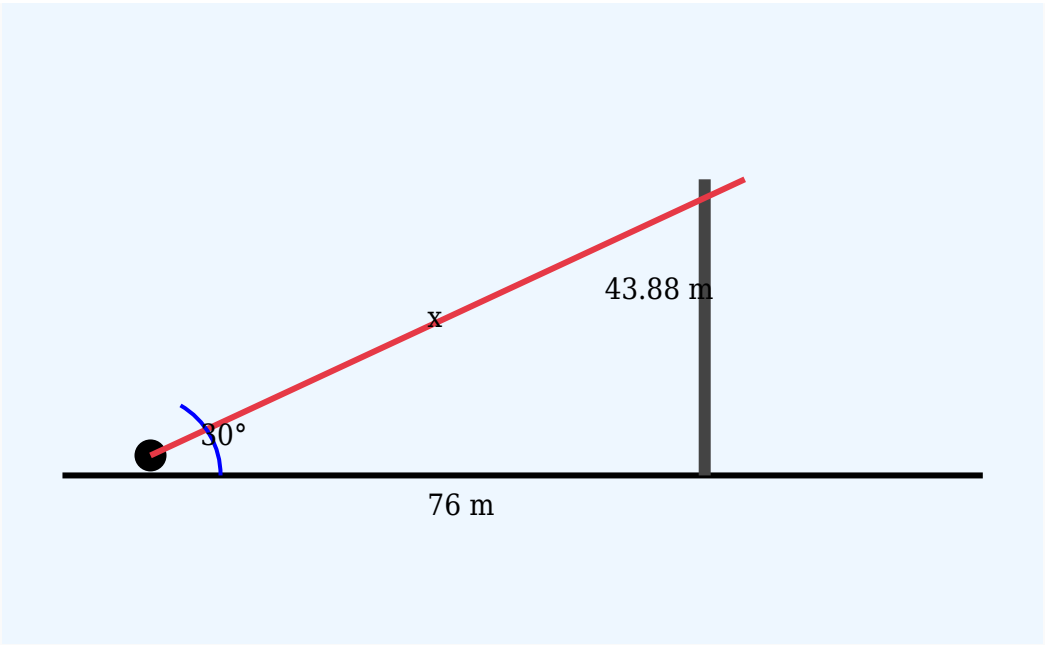
Distance = 39.44 / 0.84

Distance = 46.95 m

Answer: 46.95 m

Question 15

The angle of elevation to the top of a lighthouse is 30°. If the observer is 76 m from the base, calculate the hypotenuse.



Solution:

Using:
cos θ = Adjacent / Hypotenuse

cos 30° = 76 / Hypotenuse

0.87 = 76 / Hypotenuse

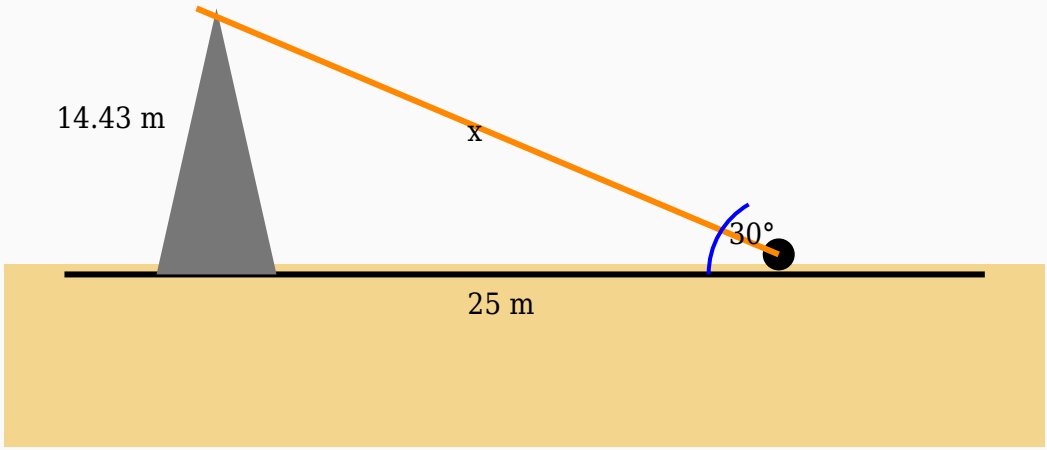
Hypotenuse = 76 / 0.87

Hypotenuse = 87.36 m

Answer: 87.36 m

Question 16

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



Solution:

Using:
cos θ = Adjacent / Hypotenuse

cos 30° = 25 / Hypotenuse

0.87 = 25 / Hypotenuse

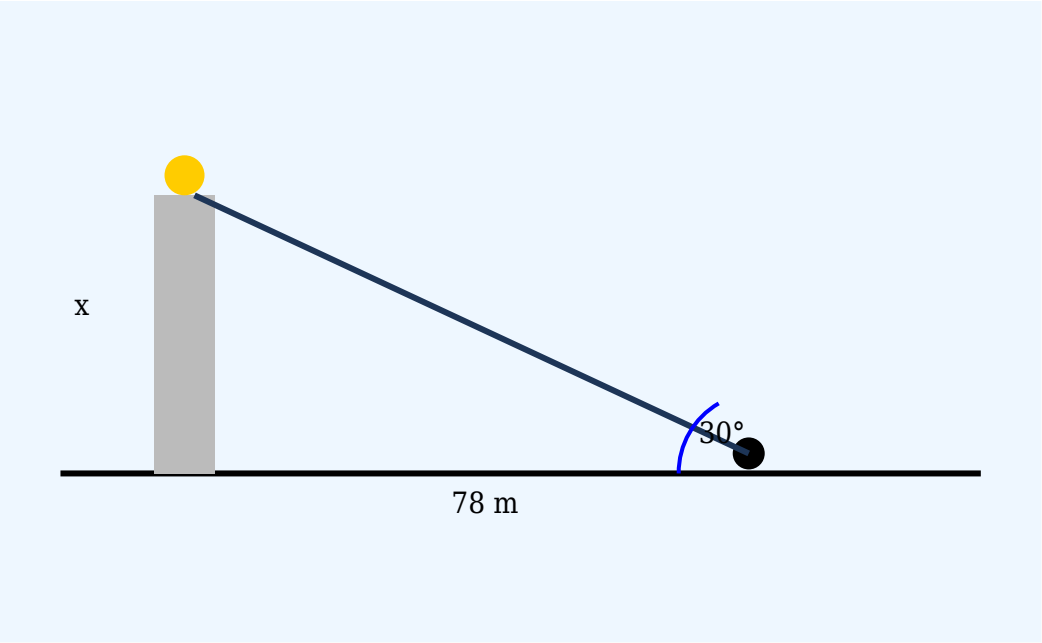
Hypotenuse = 25 / 0.87

Hypotenuse = 28.74 m

Answer: 28.74 m

Question 17

The angle of elevation of the top of a mountain from a point on the ground is 30°. If the observer is 78 m away from the mountain, calculate its height.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 30° = Height / 78

0.58 = Height / 78

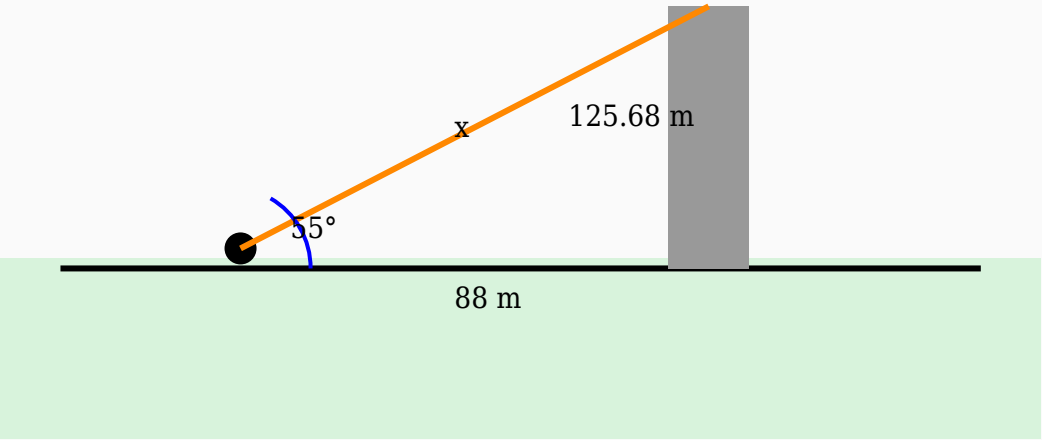
Height = 78 × 0.58

Height = 45.03 m

Answer: 45.03 m

Question 18

A person standing 88 m away from a lighthouse observes its top at an angle of elevation of 55°. Find the line of sight.



Solution:

Using:
cos θ = Adjacent / Hypotenuse

cos 55° = 88 / Hypotenuse

0.57 = 88 / Hypotenuse

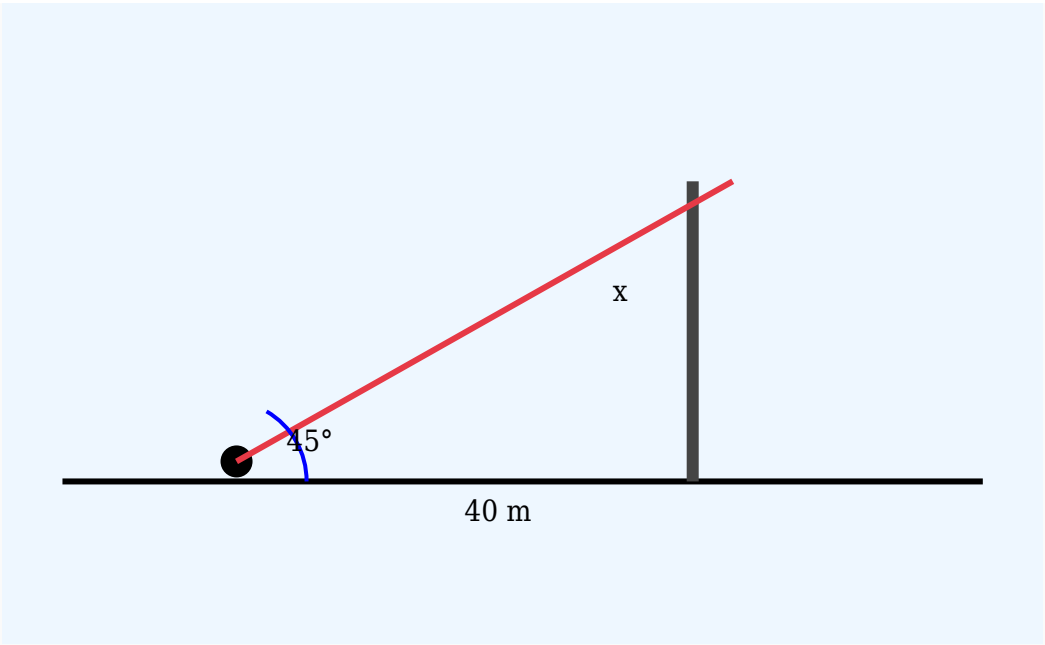
Hypotenuse = 88 / 0.57

Hypotenuse = 154.39 m

Answer: 154.39 m

Question 19

A man looks at the top of a flagpole at an angle of elevation of 45°. Find the height of the flagpole if the distance from the base is 40 m.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 45° = Height / 40

1 = Height / 40

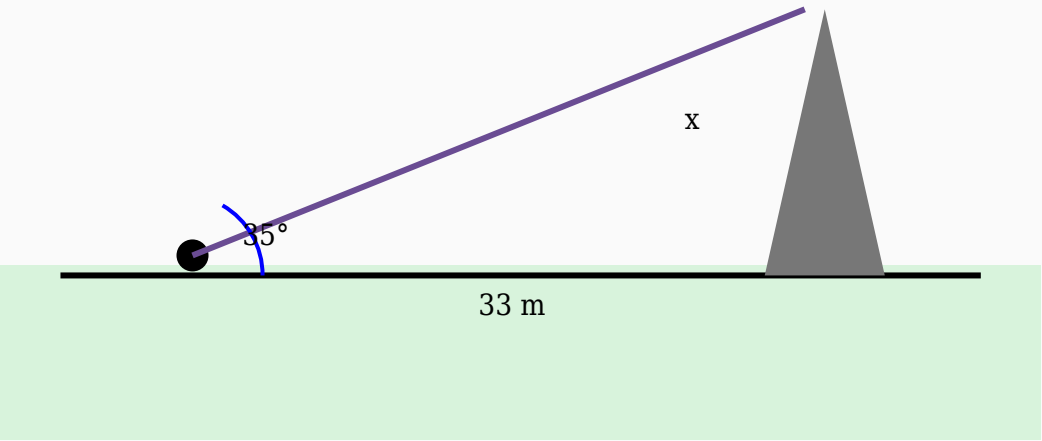
Height = 40 × 1

Height = 40 m

Answer: 40 m

Question 20

A man standing near a stadium light observes its top at an angle of elevation of 35°. If the horizontal distance is 33 m, find the height of the stadium light.



Solution:

Using:
tan θ = Opposite / Adjacent

tan 35° = Height / 33

0.7 = Height / 33

Height = 33 × 0.7

Height = 23.11 m

Answer: 23.11 m