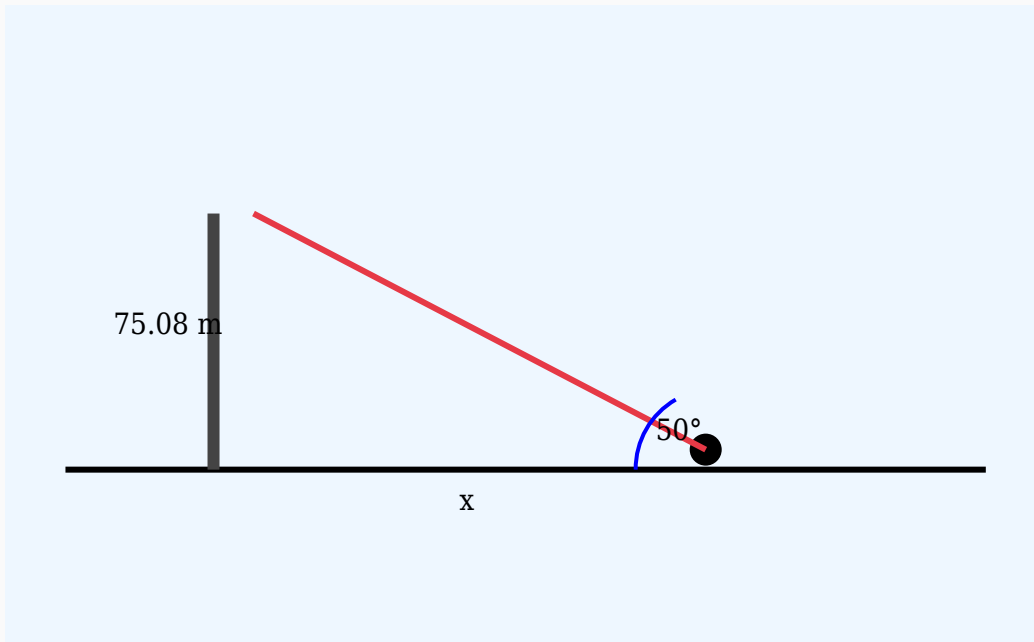


# Angle of Elevation Solved Worksheet

## Question 1

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



**Solution:**

**Using:**

$$\tan \theta = \text{Opposite} / \text{Adjacent}$$

$$\tan 50^\circ = 75.08 / \text{Distance}$$

$$1.19 = 75.08 / \text{Distance}$$

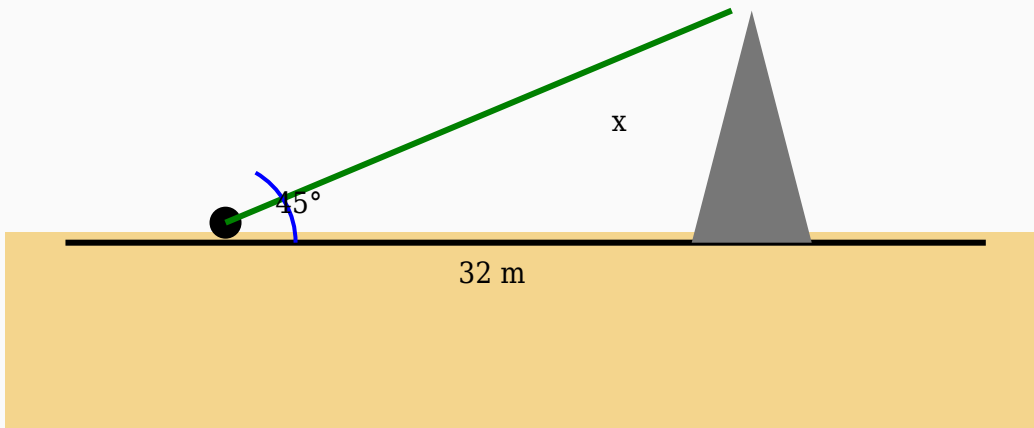
$$\text{Distance} = 75.08 / 1.19$$

$$\text{Distance} = 63.09 \text{ m}$$

**Answer:** 63.09 m

## Question 2

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



**Solution:**

**Using:**

$\tan \theta = \text{Opposite} / \text{Adjacent}$

$$\tan 45^\circ = \text{Height} / 32$$

$$1 = \text{Height} / 32$$

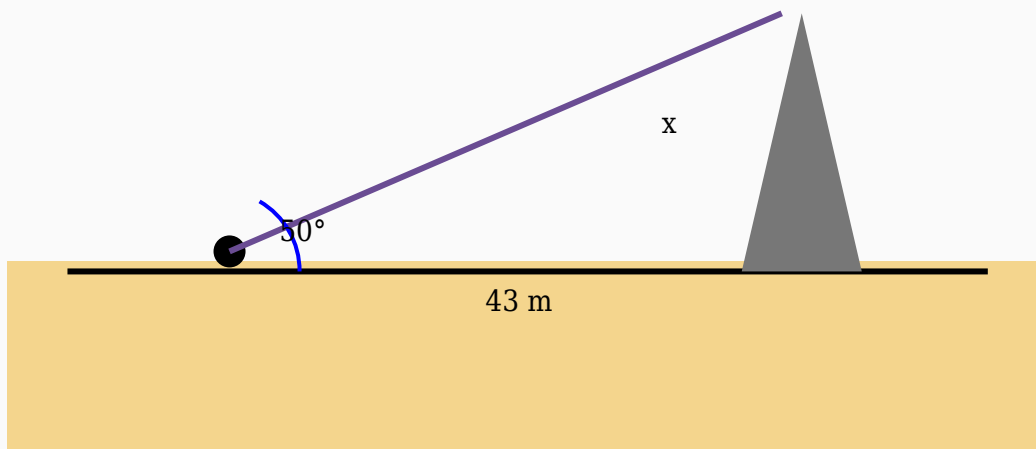
$$\text{Height} = 32 \times 1$$

$$\text{Height} = 32 \text{ m}$$

**Answer:** 32 m

## Question 3

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



**Solution:**

**Using:**

$\tan \theta = \text{Opposite} / \text{Adjacent}$

$\tan 50^\circ = \text{Height} / 43$

$1.19 = \text{Height} / 43$

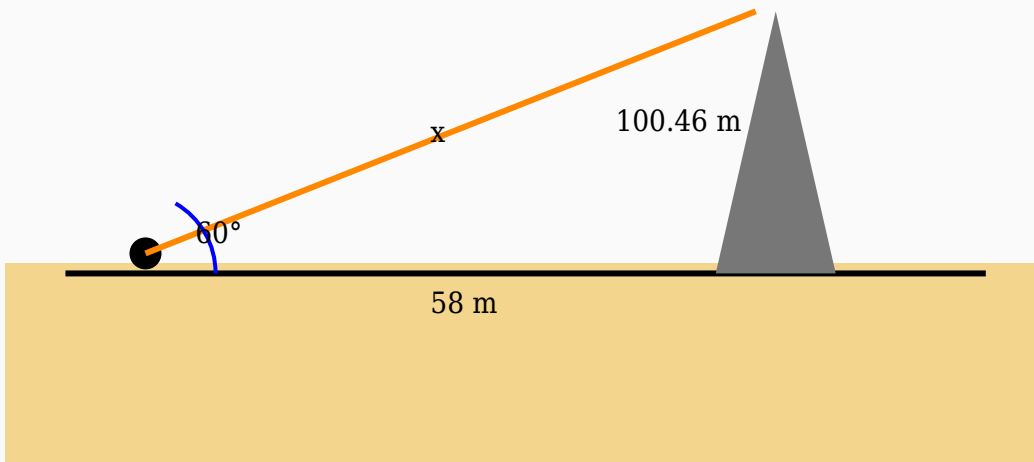
$\text{Height} = 43 \times 1.19$

$\text{Height} = 51.25 \text{ m}$

**Answer:** 51.25 m

## Question 4

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



**Solution:**

**Using:**

$$\cos \theta = \text{Adjacent} / \text{Hypotenuse}$$

$$\cos 60^\circ = 58 / \text{Hypotenuse}$$

$$0.5 = 58 / \text{Hypotenuse}$$

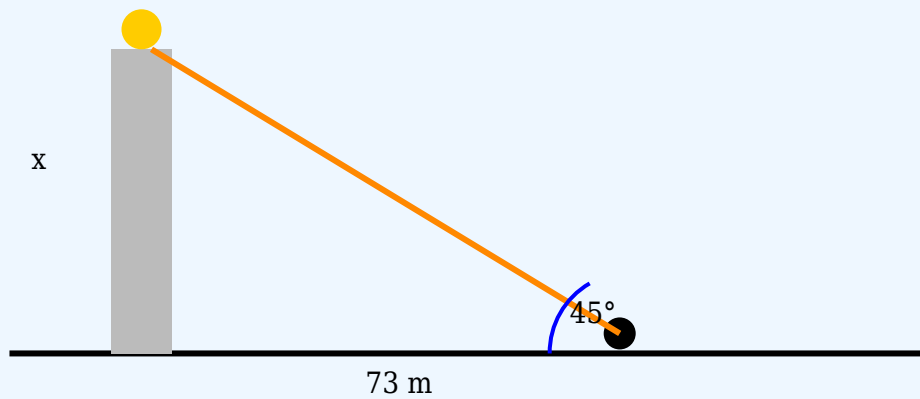
$$\text{Hypotenuse} = 58 / 0.5$$

$$\text{Hypotenuse} = 116 \text{ m}$$

**Answer:** 116 m

## Question 5

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



**Solution:**

**Using:**

$\tan \theta = \text{Opposite} / \text{Adjacent}$

$\tan 45^\circ = \text{Height} / 73$

$1 = \text{Height} / 73$

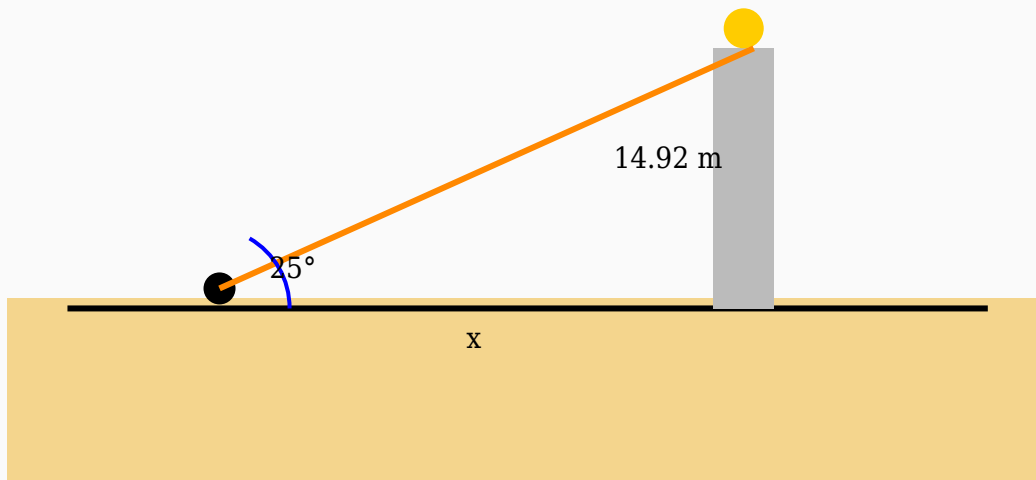
$\text{Height} = 73 \times 1$

$\text{Height} = 73 \text{ m}$

**Answer:** 73 m

## Question 6

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



**Solution:**

**Using:**

$\tan \theta = \text{Opposite} / \text{Adjacent}$

$\tan 25^\circ = 14.92 / \text{Distance}$

$0.47 = 14.92 / \text{Distance}$

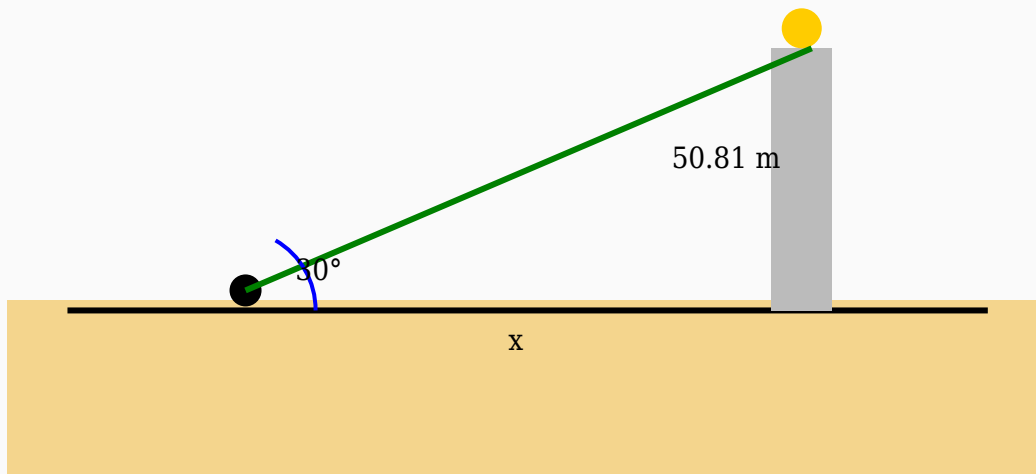
$\text{Distance} = 14.92 / 0.47$

$\text{Distance} = 31.74 \text{ m}$

**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  $30^\circ$ , calculate the horizontal distance.



**Solution:**

**Using:**

$\tan \theta = \text{Opposite} / \text{Adjacent}$

$\tan 30^\circ = 50.81 / \text{Distance}$

$0.58 = 50.81 / \text{Distance}$

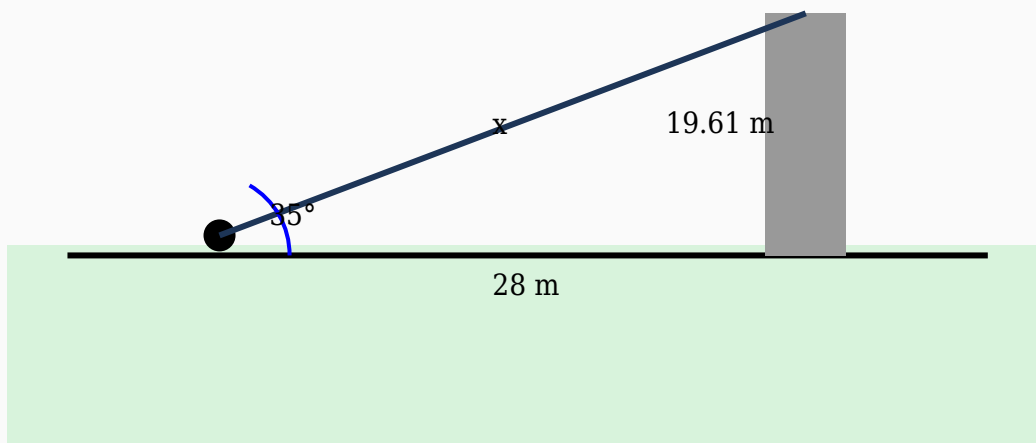
$\text{Distance} = 50.81 / 0.58$

$\text{Distance} = 87.6 \text{ m}$

**Answer:** 87.6 m

## Question 8

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



**Solution:**

**Using:**

$\cos \theta = \text{Adjacent} / \text{Hypotenuse}$

$\cos 35^\circ = 28 / \text{Hypotenuse}$

$0.82 = 28 / \text{Hypotenuse}$

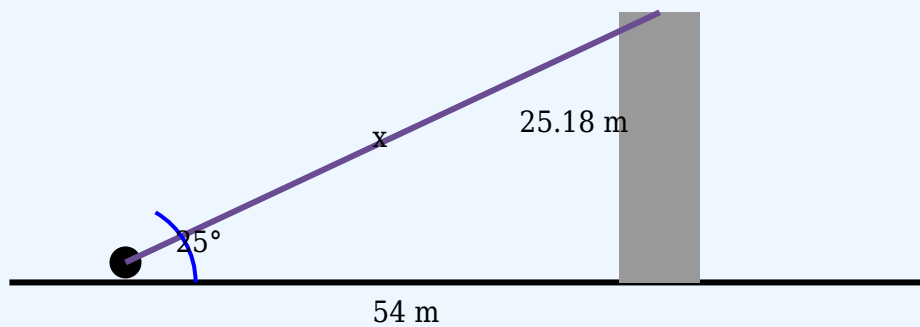
$\text{Hypotenuse} = 28 / 0.82$

$\text{Hypotenuse} = 34.15 \text{ m}$

**Answer:** 34.15 m

## Question 9

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



**Solution:**

**Using:**

$\cos \theta = \text{Adjacent} / \text{Hypotenuse}$

$\cos 25^\circ = 54 / \text{Hypotenuse}$

$0.91 = 54 / \text{Hypotenuse}$

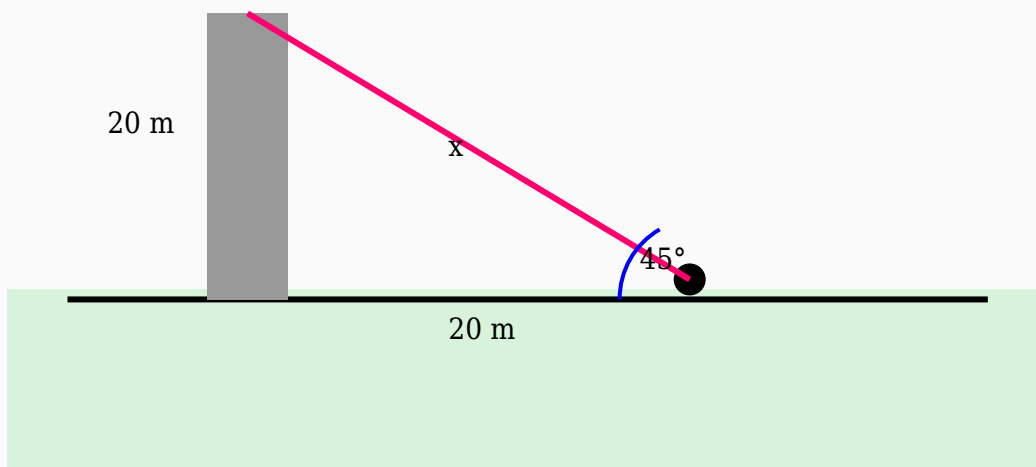
$\text{Hypotenuse} = 54 / 0.91$

$\text{Hypotenuse} = 59.34 \text{ m}$

**Answer:** 59.34 m

## Question 10

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



**Solution:**

**Using:**

$\cos \theta = \text{Adjacent} / \text{Hypotenuse}$

$\cos 45^\circ = 20 / \text{Hypotenuse}$

$0.71 = 20 / \text{Hypotenuse}$

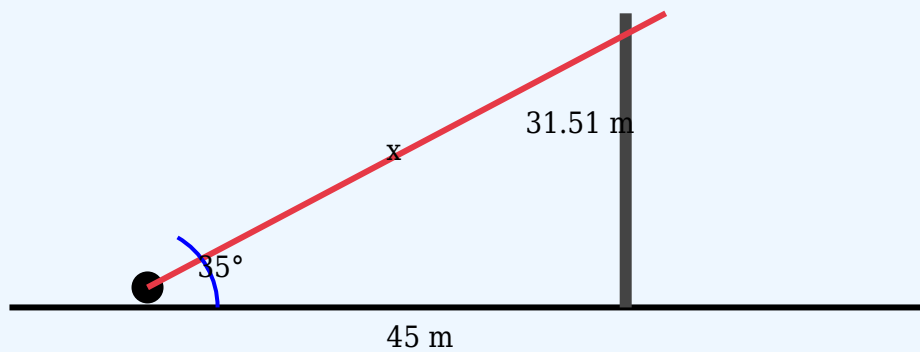
$\text{Hypotenuse} = 20 / 0.71$

$\text{Hypotenuse} = 28.17 \text{ m}$

**Answer:** 28.17 m

## Question 11

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



**Solution:**

**Using:**

$\cos \theta = \text{Adjacent} / \text{Hypotenuse}$

$\cos 35^\circ = 45 / \text{Hypotenuse}$

$0.82 = 45 / \text{Hypotenuse}$

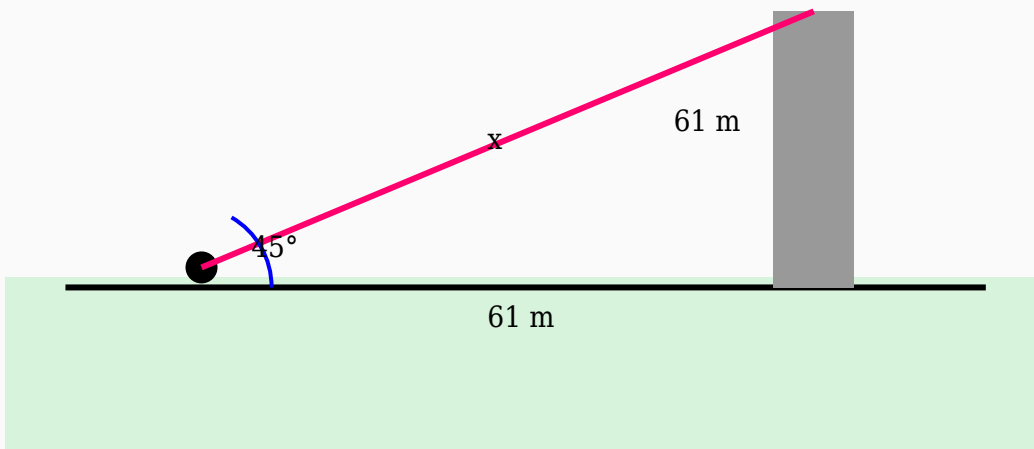
$\text{Hypotenuse} = 45 / 0.82$

$\text{Hypotenuse} = 54.88 \text{ m}$

**Answer:** 54.88 m

## Question 12

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



**Solution:**

**Using:**

$\cos \theta = \text{Adjacent} / \text{Hypotenuse}$

$\cos 45^\circ = 61 / \text{Hypotenuse}$

$0.71 = 61 / \text{Hypotenuse}$

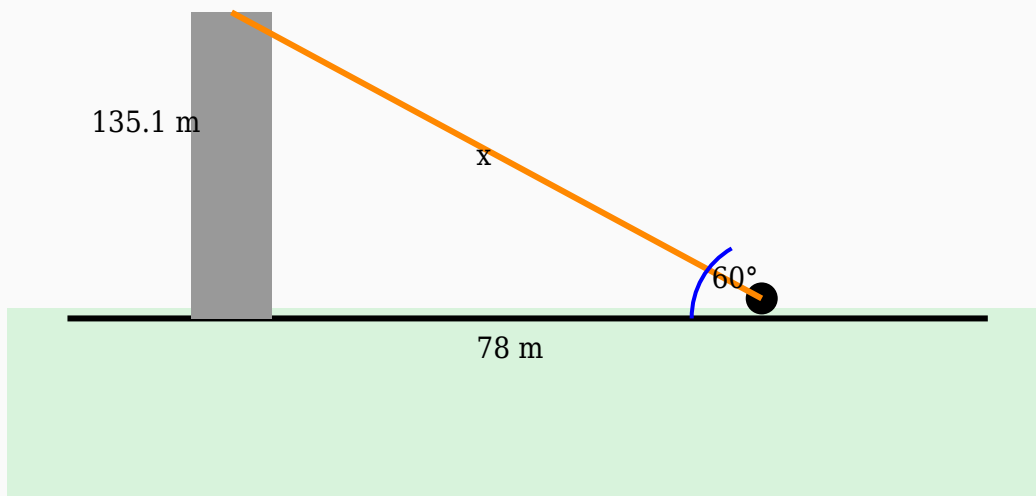
$\text{Hypotenuse} = 61 / 0.71$

$\text{Hypotenuse} = 85.92 \text{ m}$

**Answer:** 85.92 m

## Question 13

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



**Solution:**

**Using:**

$\cos \theta = \text{Adjacent} / \text{Hypotenuse}$

$\cos 60^\circ = 78 / \text{Hypotenuse}$

$0.5 = 78 / \text{Hypotenuse}$

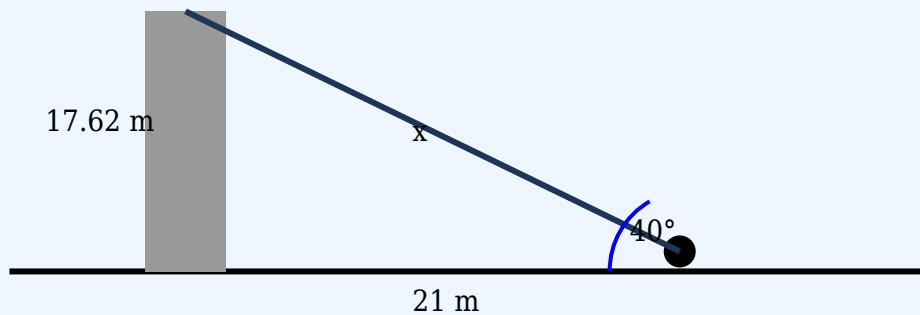
$\text{Hypotenuse} = 78 / 0.5$

$\text{Hypotenuse} = 156 \text{ m}$

**Answer:** 156 m

## Question 14

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



**Solution:**

**Using:**

$$\cos \theta = \text{Adjacent} / \text{Hypotenuse}$$

$$\cos 40^\circ = 21 / \text{Hypotenuse}$$

$$0.77 = 21 / \text{Hypotenuse}$$

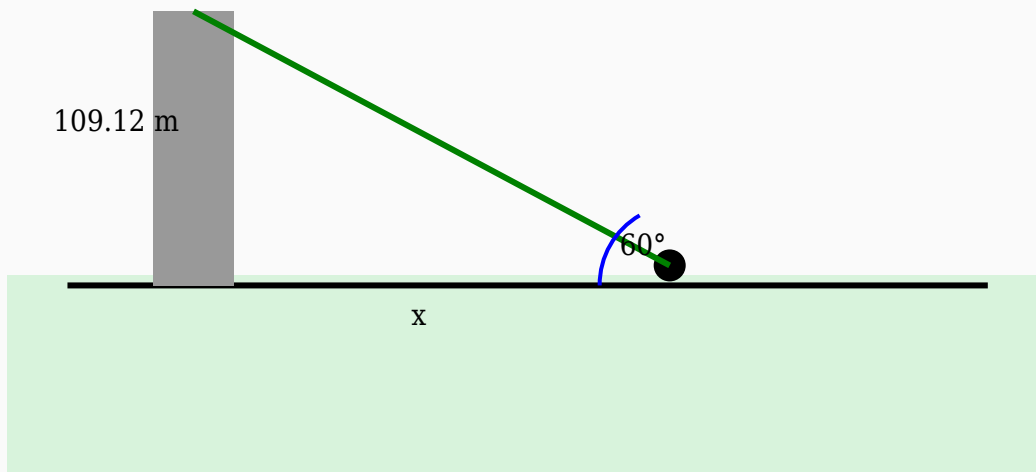
$$\text{Hypotenuse} = 21 / 0.77$$

$$\text{Hypotenuse} = 27.27 \text{ m}$$

**Answer:** 27.27 m

## Question 15

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



**Solution:**

**Using:**

$\tan \theta = \text{Opposite} / \text{Adjacent}$

$\tan 60^\circ = 109.12 / \text{Distance}$

$1.73 = 109.12 / \text{Distance}$

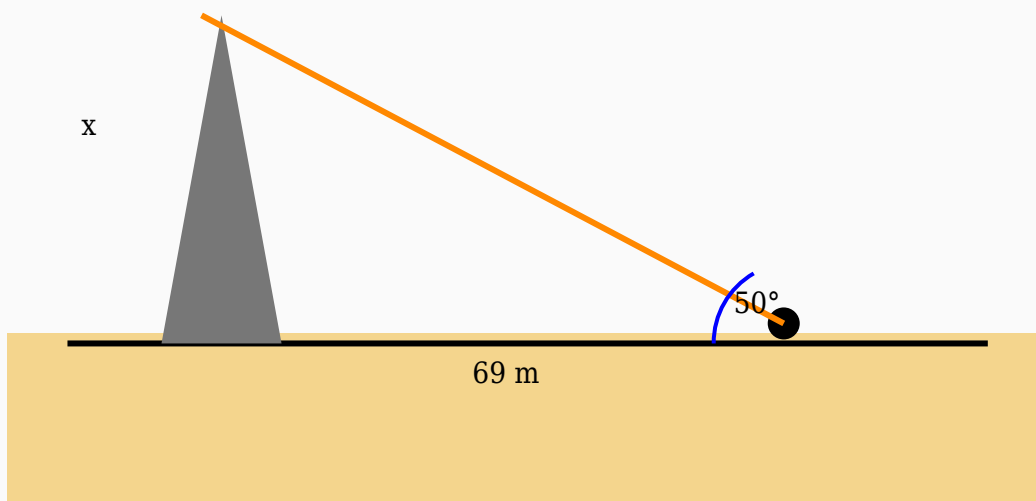
$\text{Distance} = 109.12 / 1.73$

$\text{Distance} = 63.08 \text{ m}$

**Answer:** 63.08 m

## Question 16

A woman looks at the top of a bridge at an angle of elevation of  $50^\circ$ . Find the height of the bridge if the distance from the base is 69 m.



**Solution:**

**Using:**

$\tan \theta = \text{Opposite} / \text{Adjacent}$

$\tan 50^\circ = \text{Height} / 69$

$1.19 = \text{Height} / 69$

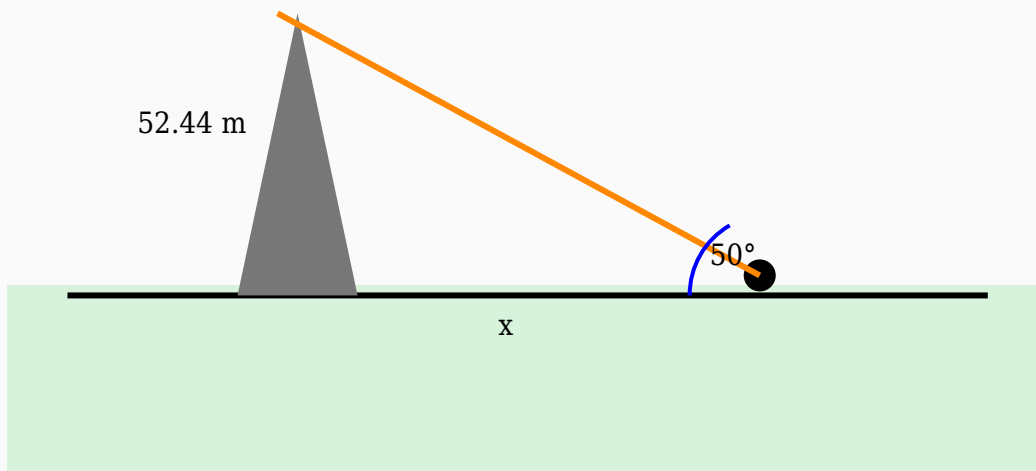
$\text{Height} = 69 \times 1.19$

$\text{Height} = 82.23 \text{ m}$

**Answer:** 82.23 m

## Question 17

A surveyor notices the top of a crane at an angle of elevation of  $50^\circ$ . Determine the horizontal distance if the height of the crane is 52.44 m.



**Solution:**

**Using:**

$\tan \theta = \text{Opposite} / \text{Adjacent}$

$\tan 50^\circ = 52.44 / \text{Distance}$

$1.19 = 52.44 / \text{Distance}$

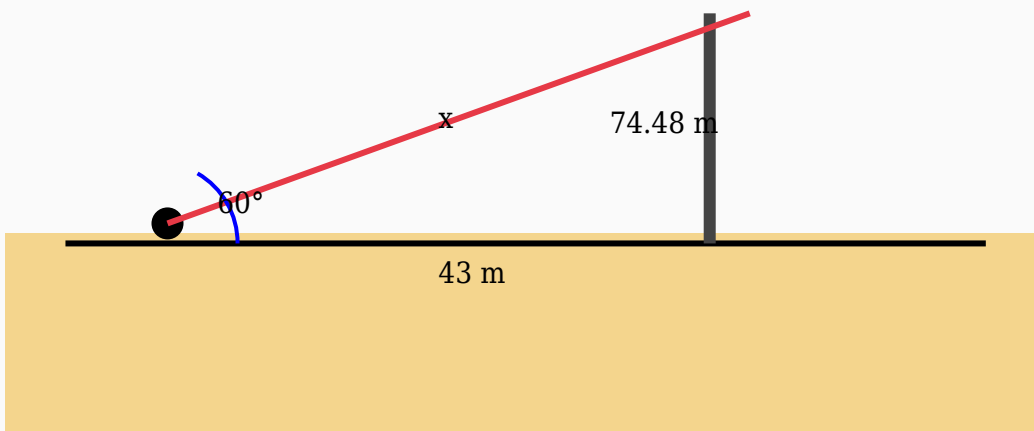
$\text{Distance} = 52.44 / 1.19$

$\text{Distance} = 44.07 \text{ m}$

**Answer:** 44.07 m

## Question 18

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



**Solution:**

**Using:**

$\cos \theta = \text{Adjacent} / \text{Hypotenuse}$

$\cos 60^\circ = 43 / \text{Hypotenuse}$

$0.5 = 43 / \text{Hypotenuse}$

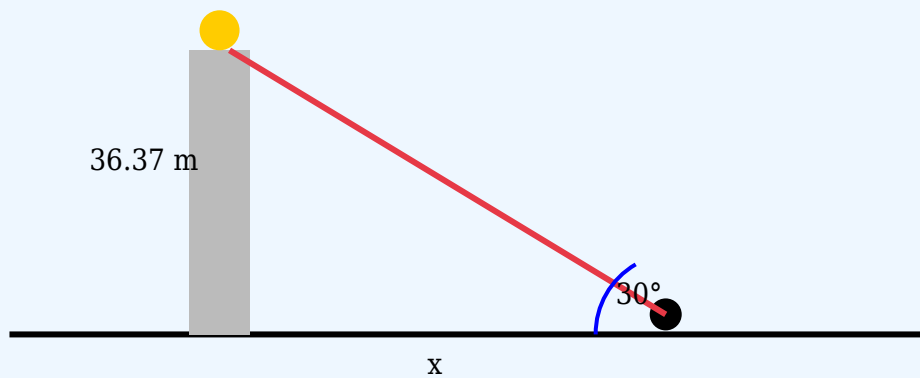
$\text{Hypotenuse} = 43 / 0.5$

$\text{Hypotenuse} = 86 \text{ m}$

**Answer:** 86 m

## Question 19

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



**Solution:**

**Using:**

$\tan \theta = \text{Opposite} / \text{Adjacent}$

$\tan 30^\circ = 36.37 / \text{Distance}$

$0.58 = 36.37 / \text{Distance}$

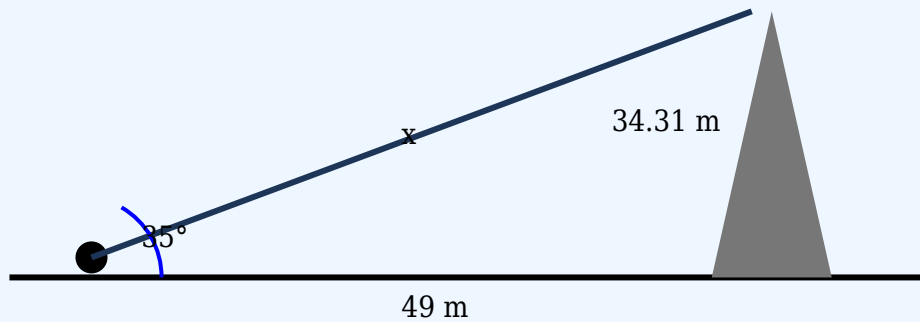
$\text{Distance} = 36.37 / 0.58$

$\text{Distance} = 62.71 \text{ m}$

**Answer:** 62.71 m

## Question 20

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



**Solution:**

**Using:**

$\cos \theta = \text{Adjacent} / \text{Hypotenuse}$

$\cos 35^\circ = 49 / \text{Hypotenuse}$

$0.82 = 49 / \text{Hypotenuse}$

$\text{Hypotenuse} = 49 / 0.82$

$\text{Hypotenuse} = 59.76 \text{ m}$

**Answer:** 59.76 m