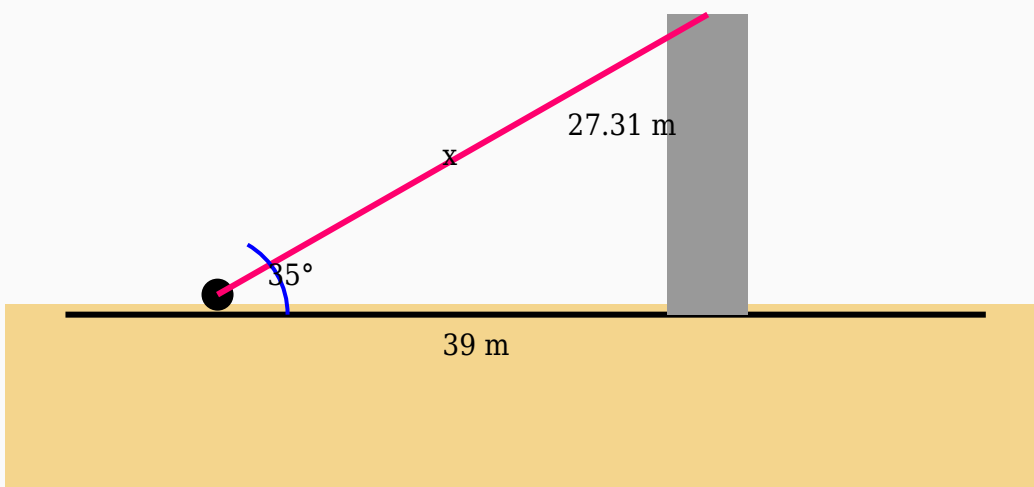


Angle of Elevation Solved Worksheet

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:

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

$$\cos 35^\circ = 39 / \text{Hypotenuse}$$

$$0.82 = 39 / \text{Hypotenuse}$$

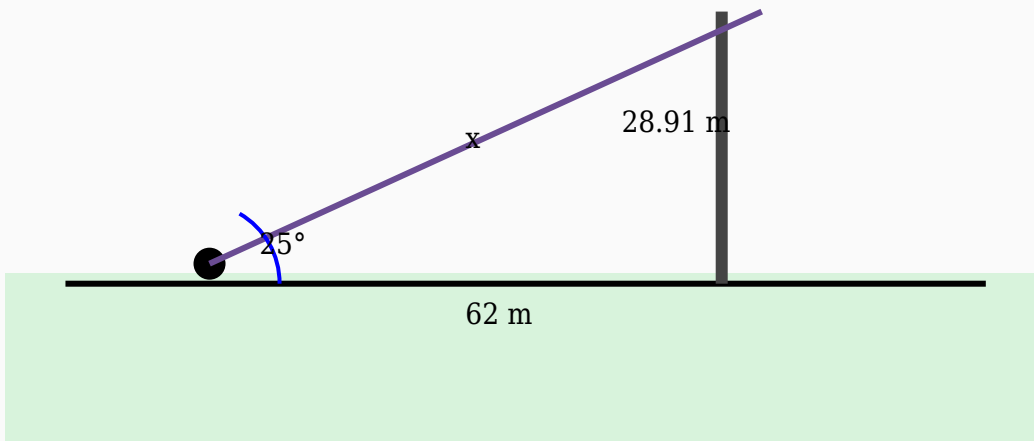
$$\text{Hypotenuse} = 39 / 0.82$$

$$\text{Hypotenuse} = 47.56 \text{ m}$$

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:

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

$$\cos 25^\circ = 62 / \text{Hypotenuse}$$

$$0.91 = 62 / \text{Hypotenuse}$$

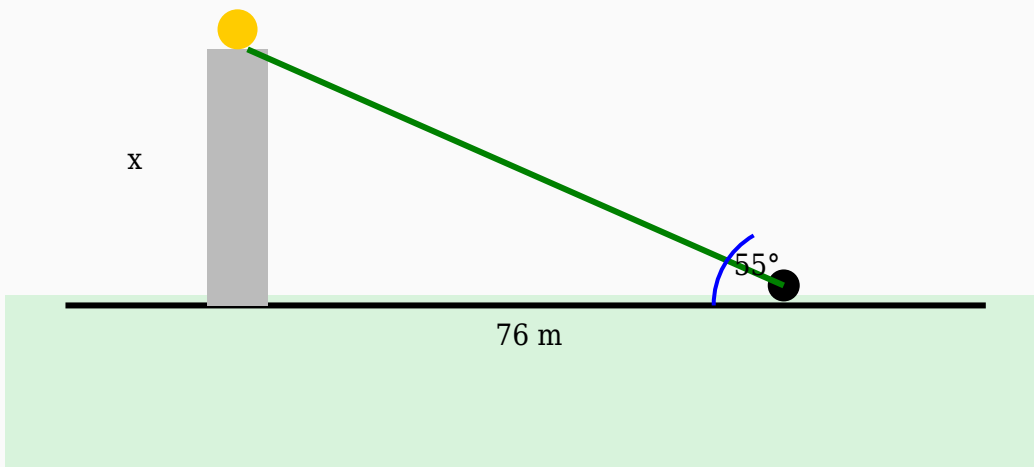
$$\text{Hypotenuse} = 62 / 0.91$$

$$\text{Hypotenuse} = 68.13 \text{ m}$$

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:

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

$\tan 55^\circ = \text{Height} / 76$

$1.43 = \text{Height} / 76$

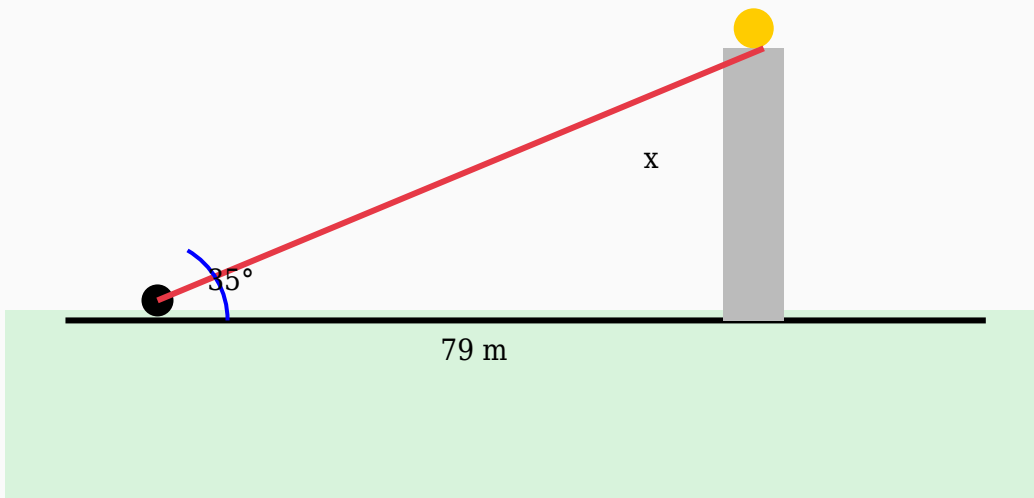
$\text{Height} = 76 \times 1.43$

$\text{Height} = 108.54 \text{ m}$

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:

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

$\tan 35^\circ = \text{Height} / 79$

$0.7 = \text{Height} / 79$

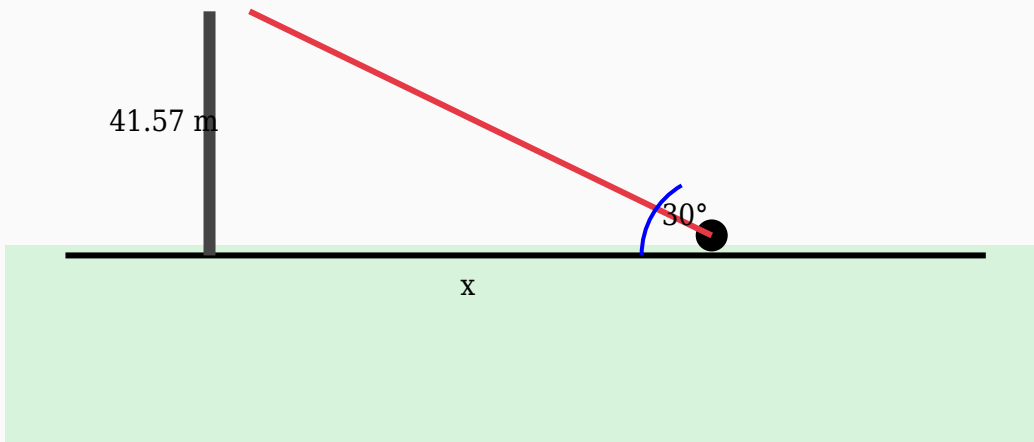
$\text{Height} = 79 \times 0.7$

$\text{Height} = 55.32 \text{ m}$

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:

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

$\tan 30^\circ = 41.57 / \text{Distance}$

$0.58 = 41.57 / \text{Distance}$

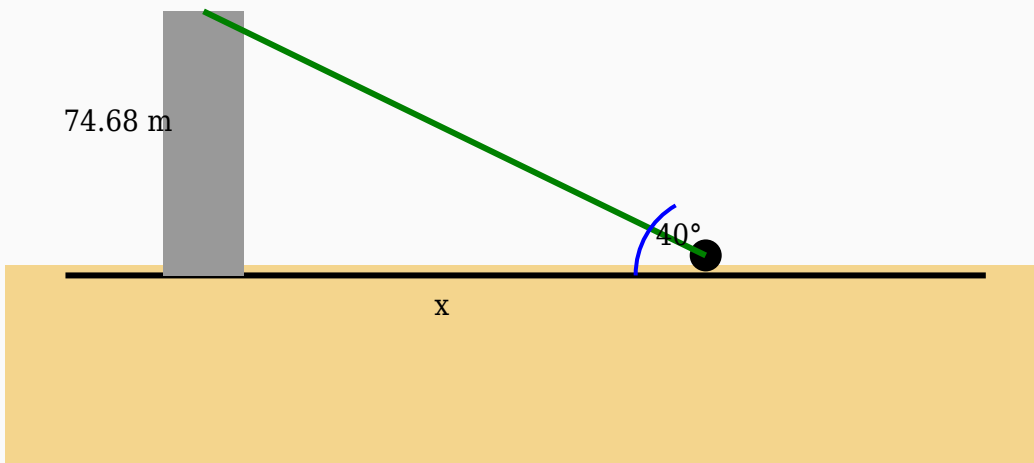
$\text{Distance} = 41.57 / 0.58$

$\text{Distance} = 71.67 \text{ m}$

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:

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

$\tan 40^\circ = 74.68 / \text{Distance}$

$0.84 = 74.68 / \text{Distance}$

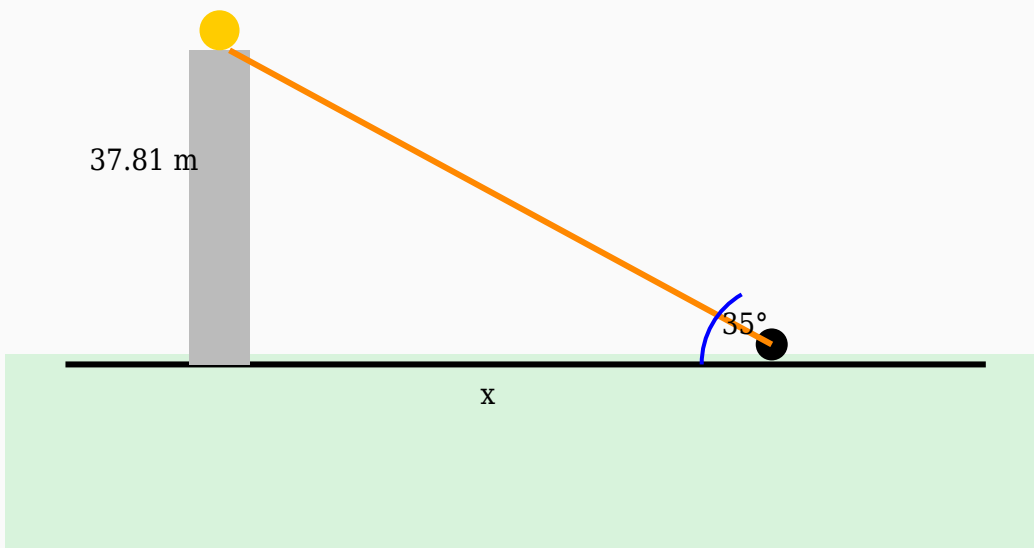
$\text{Distance} = 74.68 / 0.84$

$\text{Distance} = 88.9 \text{ m}$

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:

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

$\tan 35^\circ = 37.81 / \text{Distance}$

$0.7 = 37.81 / \text{Distance}$

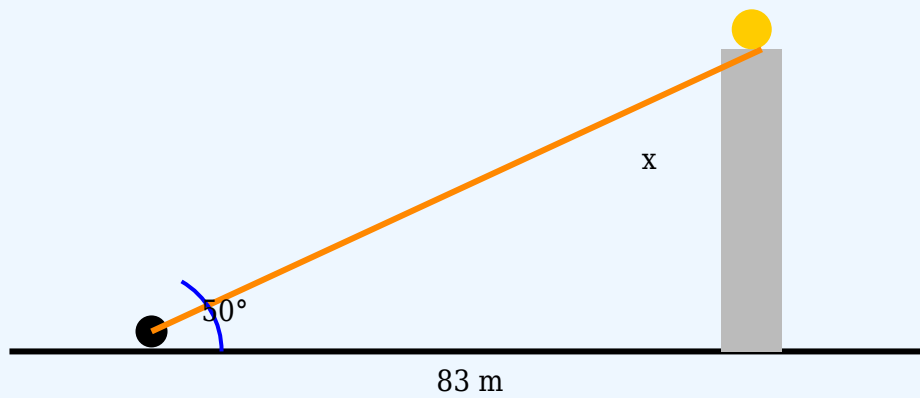
$\text{Distance} = 37.81 / 0.7$

$\text{Distance} = 54.01 \text{ m}$

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:

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

$\tan 50^\circ = \text{Height} / 83$

$1.19 = \text{Height} / 83$

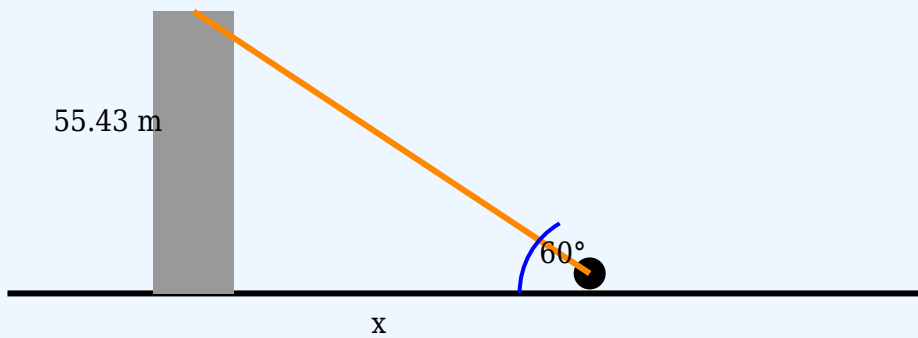
$\text{Height} = 83 \times 1.19$

$\text{Height} = 98.92 \text{ m}$

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:

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

$\tan 60^\circ = 55.43 / \text{Distance}$

$1.73 = 55.43 / \text{Distance}$

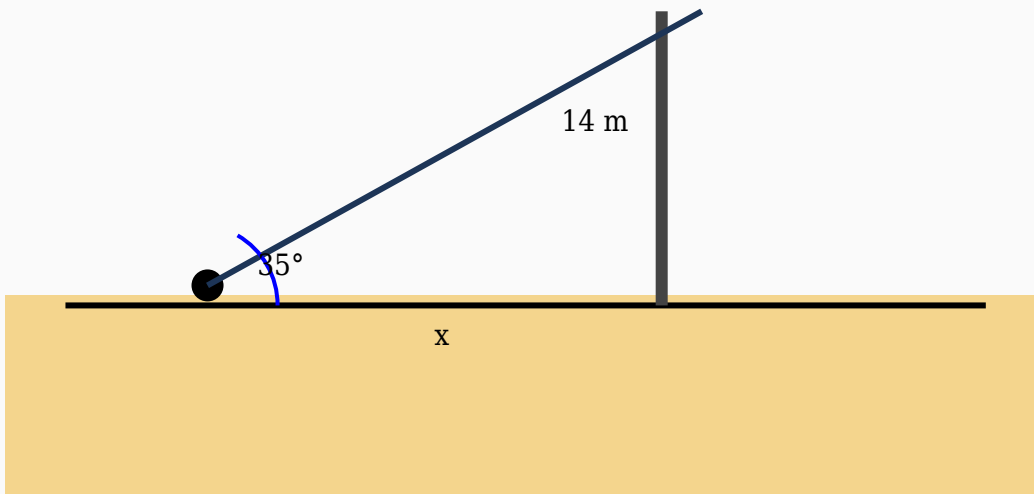
$\text{Distance} = 55.43 / 1.73$

$\text{Distance} = 32.04 \text{ m}$

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:

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

$\tan 35^\circ = 14 / \text{Distance}$

$0.7 = 14 / \text{Distance}$

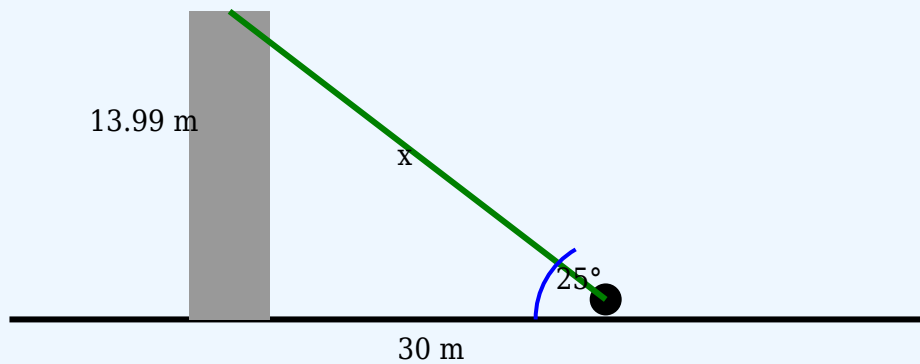
$\text{Distance} = 14 / 0.7$

$\text{Distance} = 20 \text{ m}$

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:

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

$$\cos 25^\circ = 30 / \text{Hypotenuse}$$

$$0.91 = 30 / \text{Hypotenuse}$$

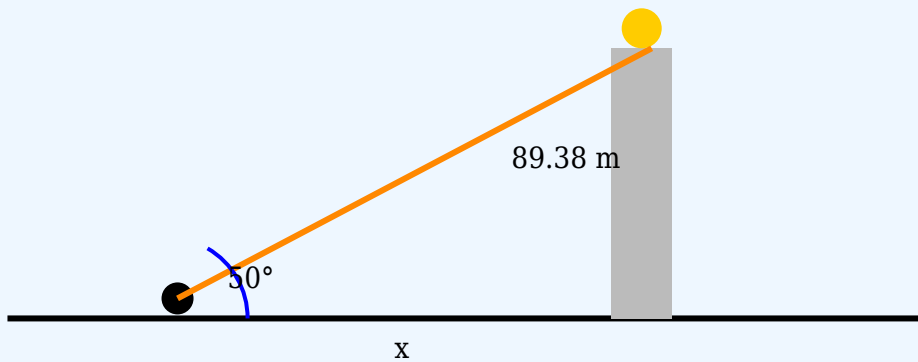
$$\text{Hypotenuse} = 30 / 0.91$$

$$\text{Hypotenuse} = 32.97 \text{ m}$$

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:

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

$\tan 50^\circ = 89.38 / \text{Distance}$

$1.19 = 89.38 / \text{Distance}$

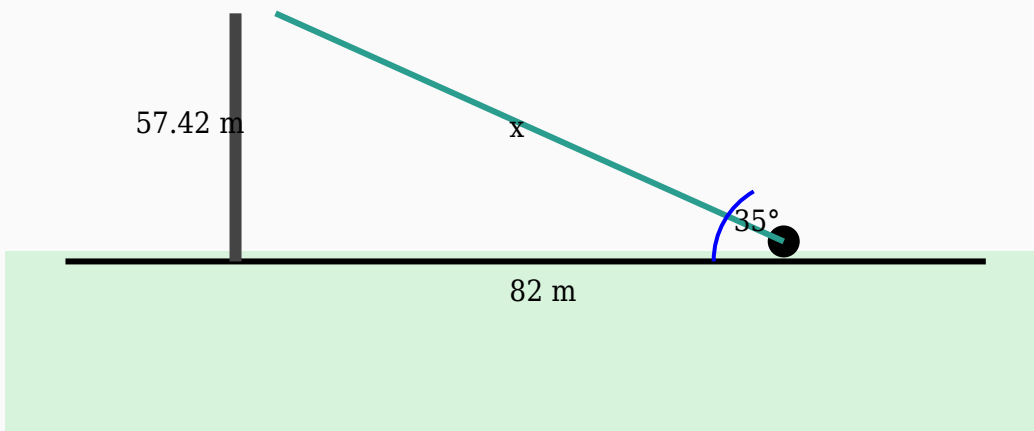
$\text{Distance} = 89.38 / 1.19$

$\text{Distance} = 75.11 \text{ m}$

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:

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

$$\cos 35^\circ = 82 / \text{Hypotenuse}$$

$$0.82 = 82 / \text{Hypotenuse}$$

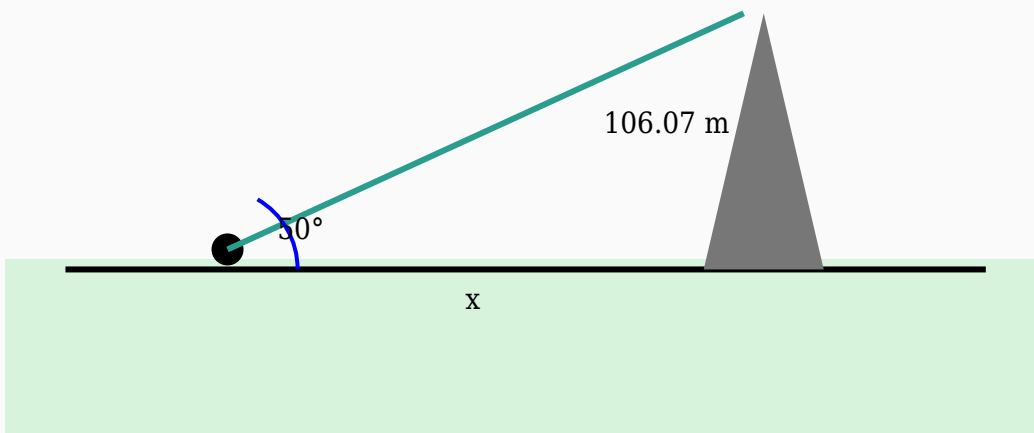
$$\text{Hypotenuse} = 82 / 0.82$$

$$\text{Hypotenuse} = 100 \text{ m}$$

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:

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

$\tan 50^\circ = 106.07 / \text{Distance}$

$1.19 = 106.07 / \text{Distance}$

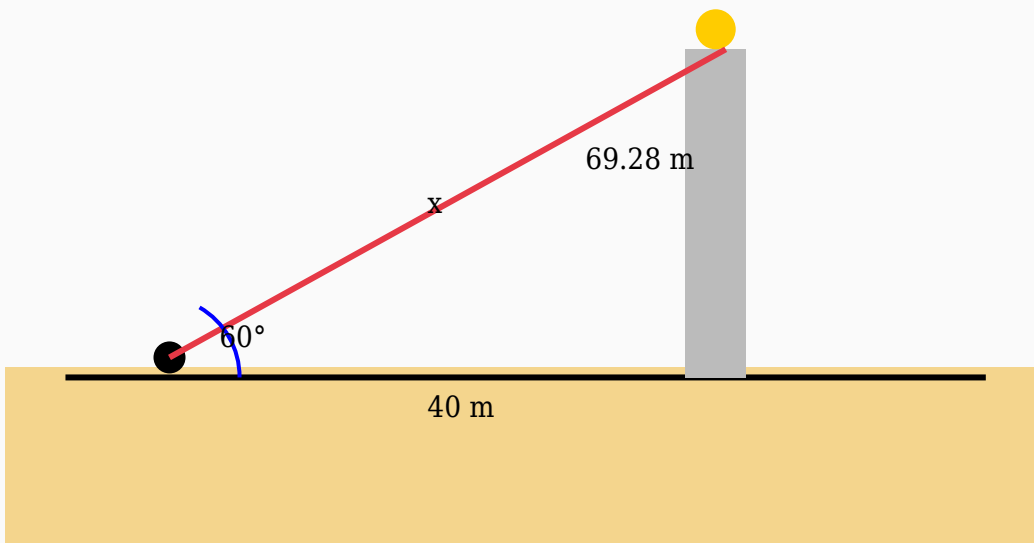
$\text{Distance} = 106.07 / 1.19$

$\text{Distance} = 89.13 \text{ m}$

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:

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

$$\cos 60^\circ = 40 / \text{Hypotenuse}$$

$$0.5 = 40 / \text{Hypotenuse}$$

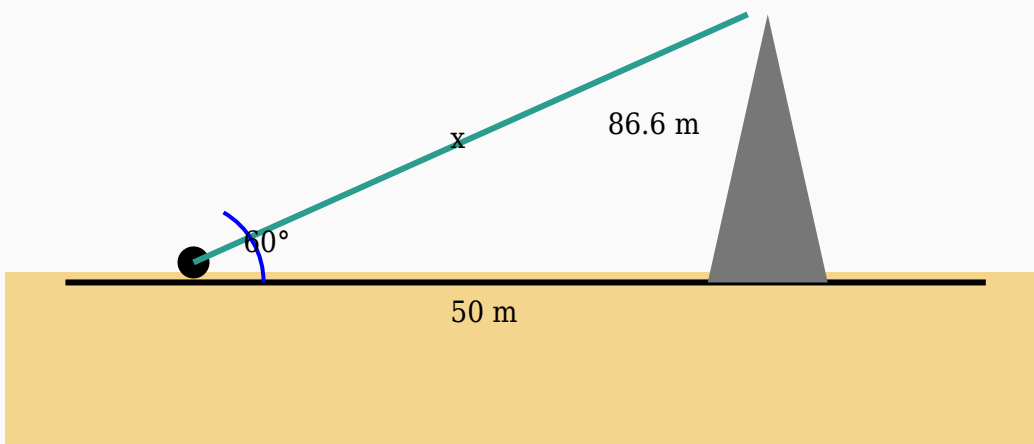
$$\text{Hypotenuse} = 40 / 0.5$$

$$\text{Hypotenuse} = 80 \text{ m}$$

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:

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

$$\cos 60^\circ = 50 / \text{Hypotenuse}$$

$$0.5 = 50 / \text{Hypotenuse}$$

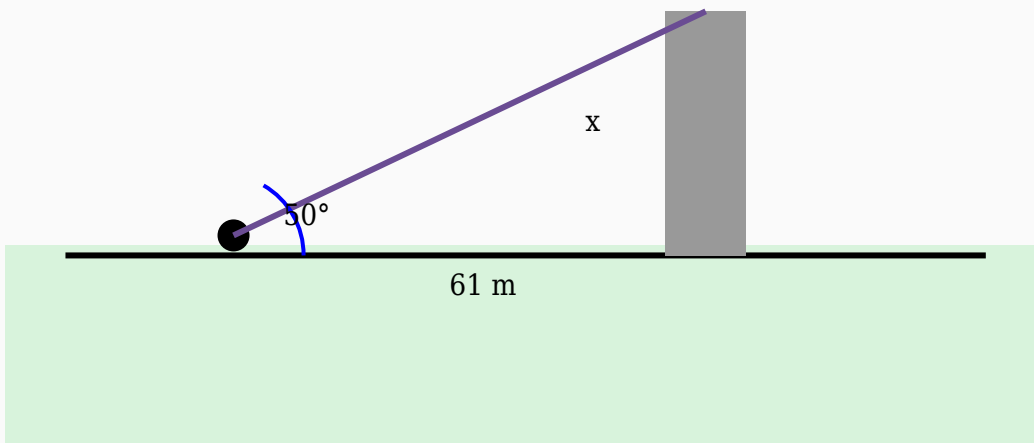
$$\text{Hypotenuse} = 50 / 0.5$$

$$\text{Hypotenuse} = 100 \text{ m}$$

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:

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

$\tan 50^\circ = \text{Height} / 61$

$1.19 = \text{Height} / 61$

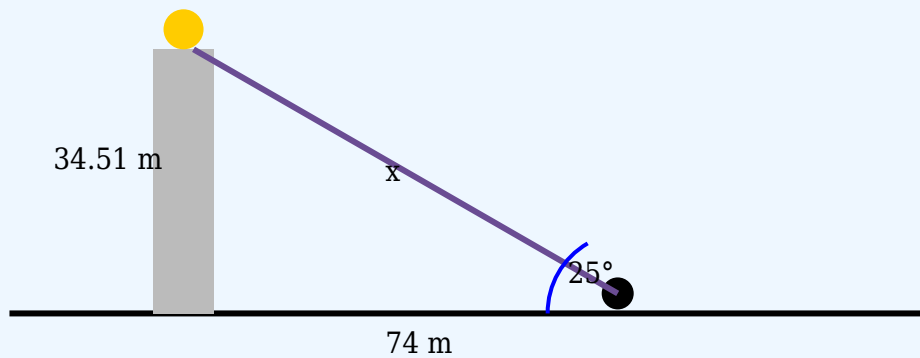
$\text{Height} = 61 \times 1.19$

$\text{Height} = 72.7 \text{ m}$

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:

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

$$\cos 25^\circ = 74 / \text{Hypotenuse}$$

$$0.91 = 74 / \text{Hypotenuse}$$

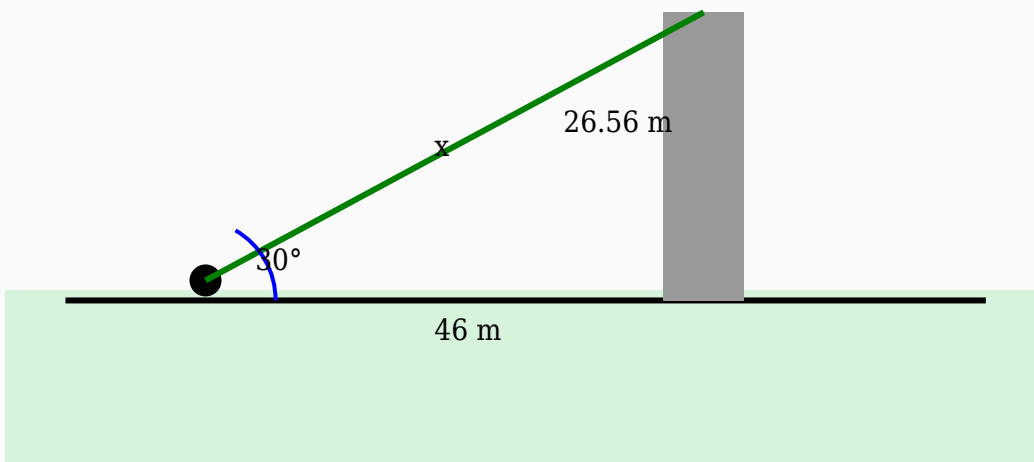
$$\text{Hypotenuse} = 74 / 0.91$$

$$\text{Hypotenuse} = 81.32 \text{ m}$$

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:

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

$$\cos 30^\circ = 46 / \text{Hypotenuse}$$

$$0.87 = 46 / \text{Hypotenuse}$$

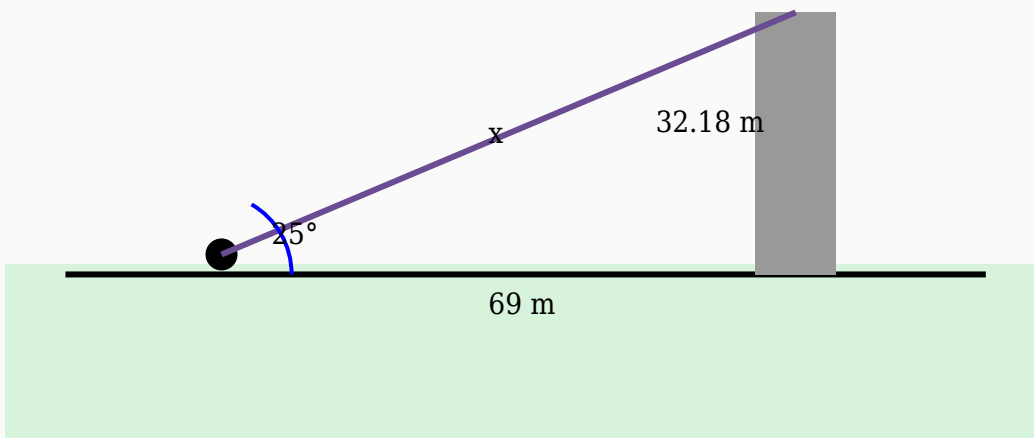
$$\text{Hypotenuse} = 46 / 0.87$$

$$\text{Hypotenuse} = 52.87 \text{ m}$$

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:

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

$$\cos 25^\circ = 69 / \text{Hypotenuse}$$

$$0.91 = 69 / \text{Hypotenuse}$$

$$\text{Hypotenuse} = 69 / 0.91$$

$$\text{Hypotenuse} = 75.82 \text{ m}$$

Answer: 75.82 m