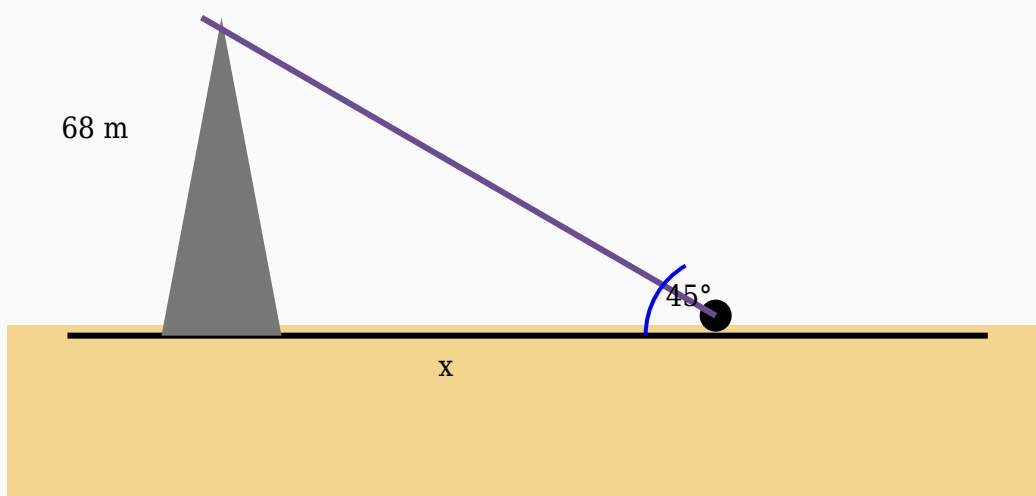


Angle of Elevation Solved Worksheet

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:

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

$$\tan 45^\circ = 68 / \text{Distance}$$

$$1 = 68 / \text{Distance}$$

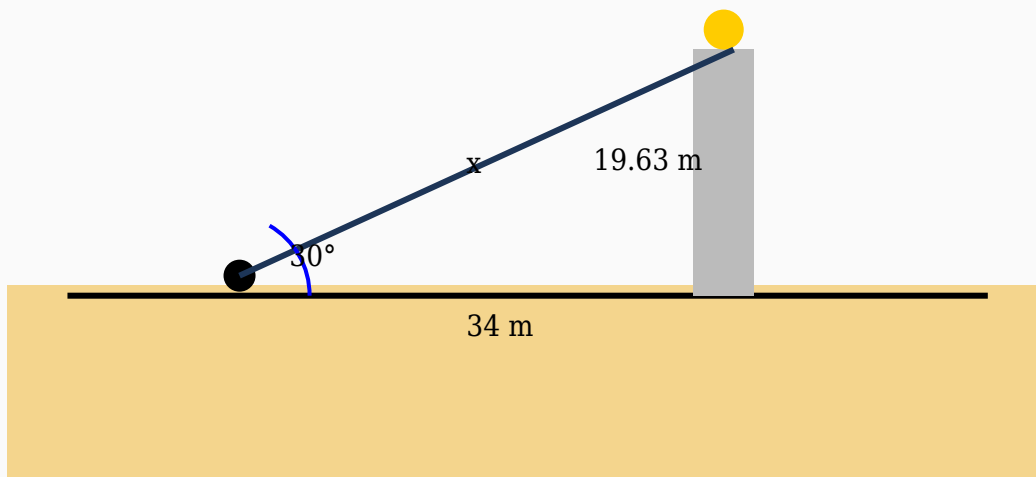
$$\text{Distance} = 68 / 1$$

$$\text{Distance} = 68 \text{ m}$$

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:

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

$$\cos 30^\circ = 34 / \text{Hypotenuse}$$

$$0.87 = 34 / \text{Hypotenuse}$$

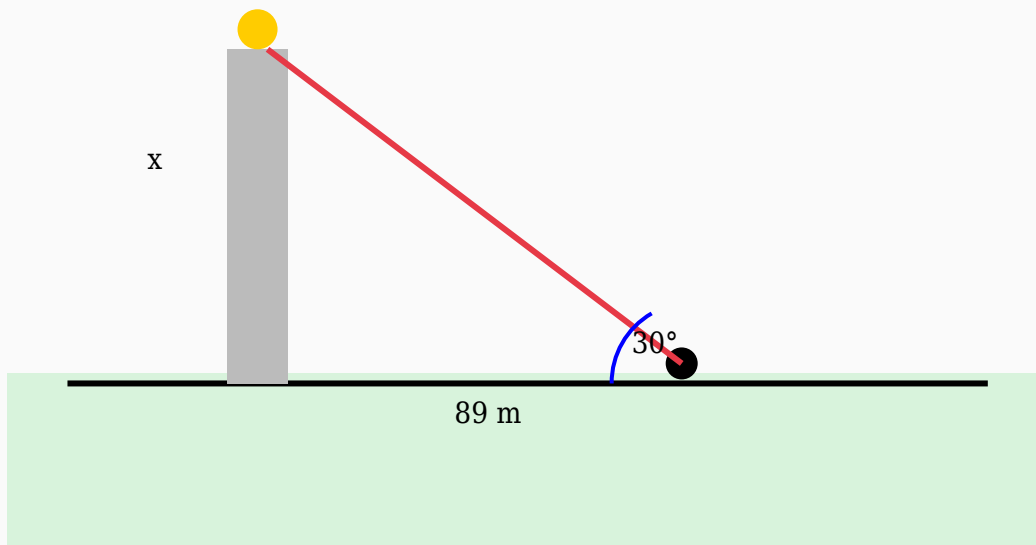
$$\text{Hypotenuse} = 34 / 0.87$$

$$\text{Hypotenuse} = 39.08 \text{ m}$$

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:

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

$\tan 30^\circ = \text{Height} / 89$

$0.58 = \text{Height} / 89$

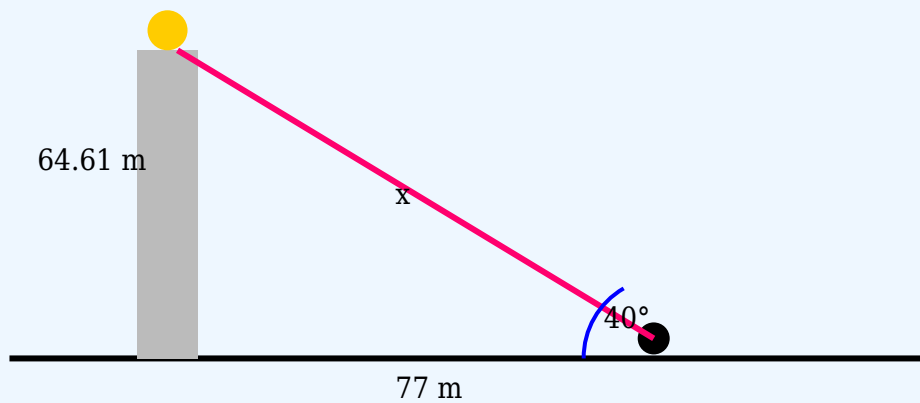
$\text{Height} = 89 \times 0.58$

$\text{Height} = 51.38 \text{ m}$

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:

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

$$\cos 40^\circ = 77 / \text{Hypotenuse}$$

$$0.77 = 77 / \text{Hypotenuse}$$

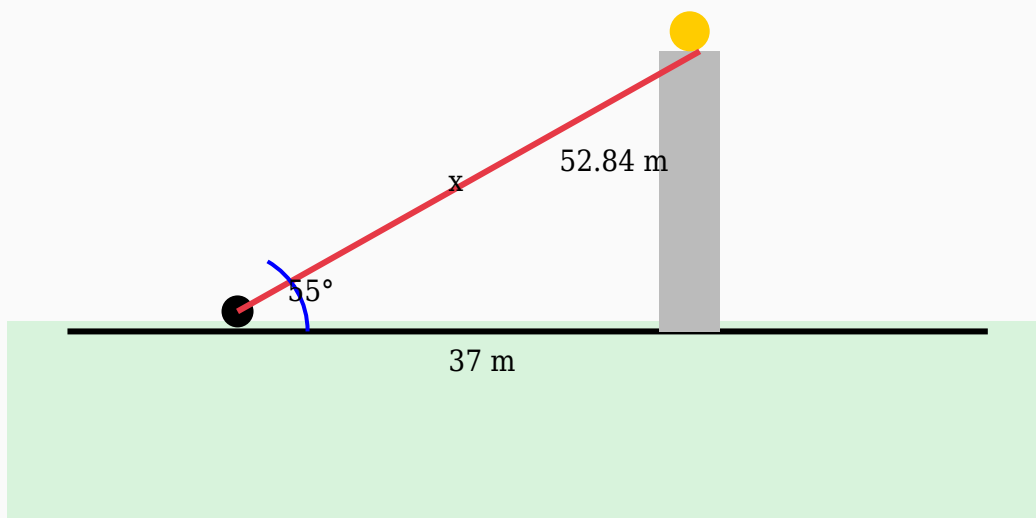
$$\text{Hypotenuse} = 77 / 0.77$$

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

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:

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

$$\cos 55^\circ = 37 / \text{Hypotenuse}$$

$$0.57 = 37 / \text{Hypotenuse}$$

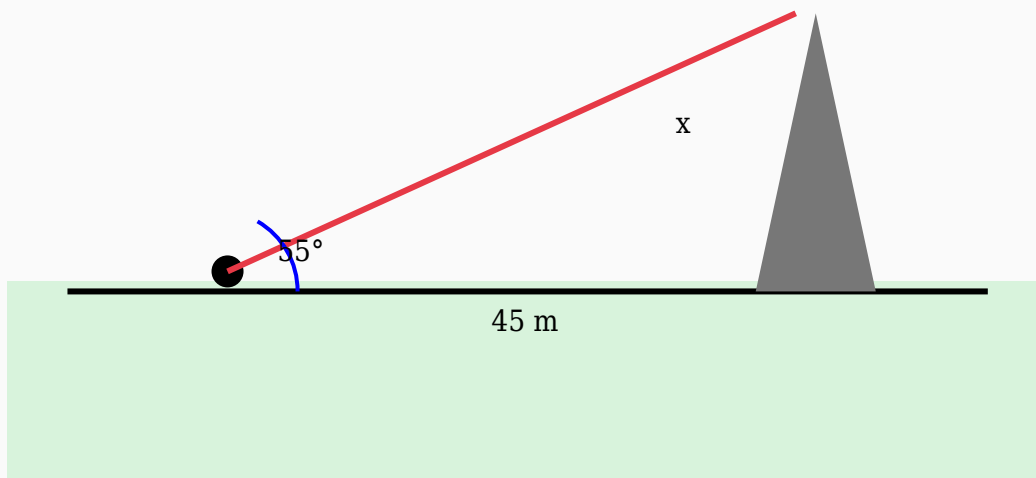
$$\text{Hypotenuse} = 37 / 0.57$$

$$\text{Hypotenuse} = 64.91 \text{ m}$$

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:

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

$\tan 55^\circ = \text{Height} / 45$

$1.43 = \text{Height} / 45$

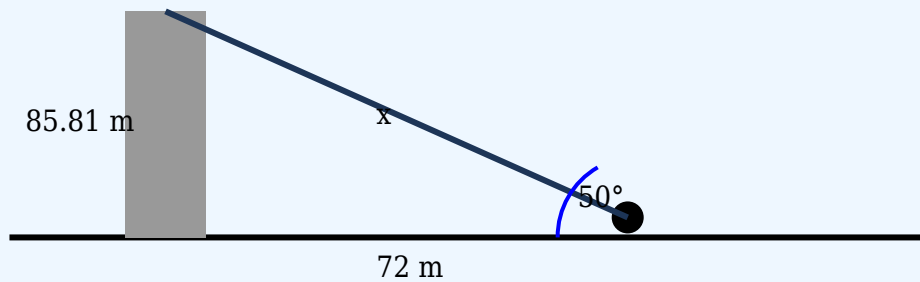
$\text{Height} = 45 \times 1.43$

$\text{Height} = 64.27 \text{ m}$

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:

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

$$\cos 50^\circ = 72 / \text{Hypotenuse}$$

$$0.64 = 72 / \text{Hypotenuse}$$

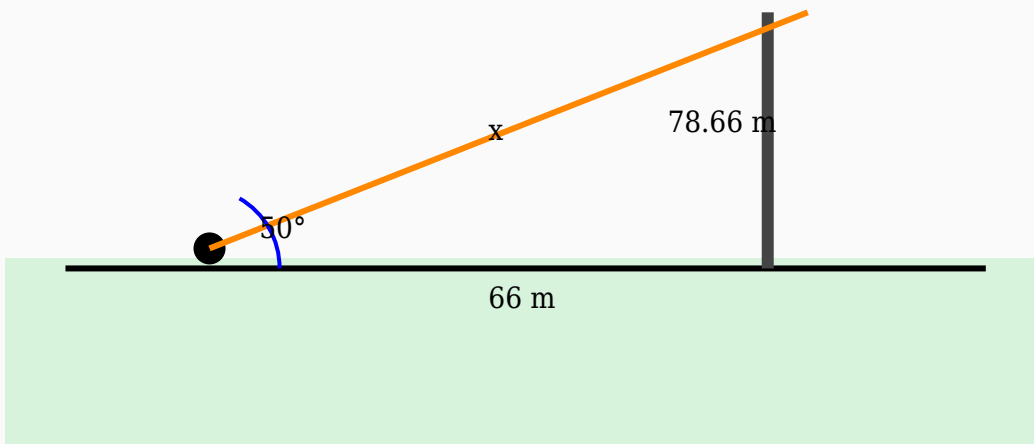
$$\text{Hypotenuse} = 72 / 0.64$$

$$\text{Hypotenuse} = 112.5 \text{ m}$$

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:

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

$\cos 50^\circ = 66 / \text{Hypotenuse}$

$0.64 = 66 / \text{Hypotenuse}$

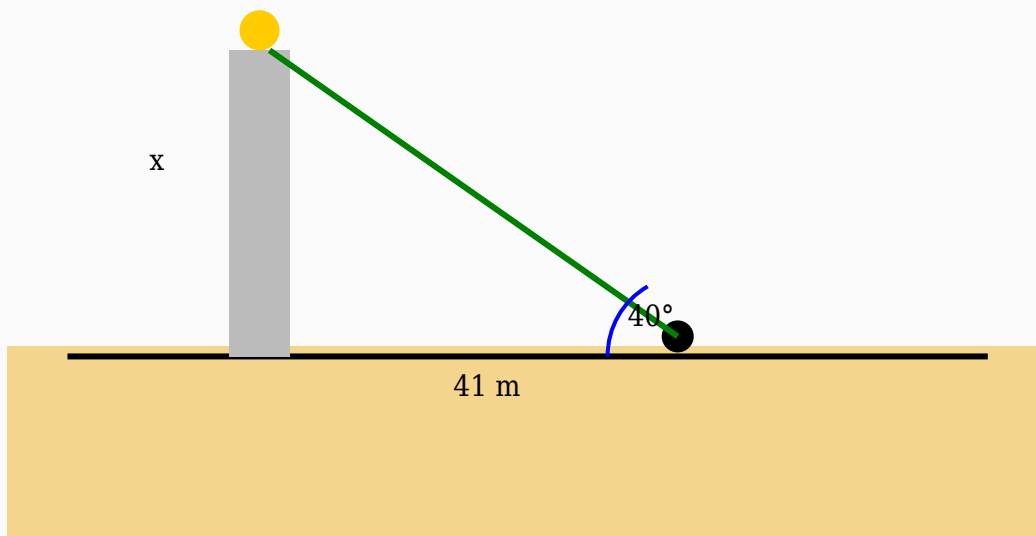
$\text{Hypotenuse} = 66 / 0.64$

$\text{Hypotenuse} = 103.13 \text{ m}$

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:

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

$\tan 40^\circ = \text{Height} / 41$

$0.84 = \text{Height} / 41$

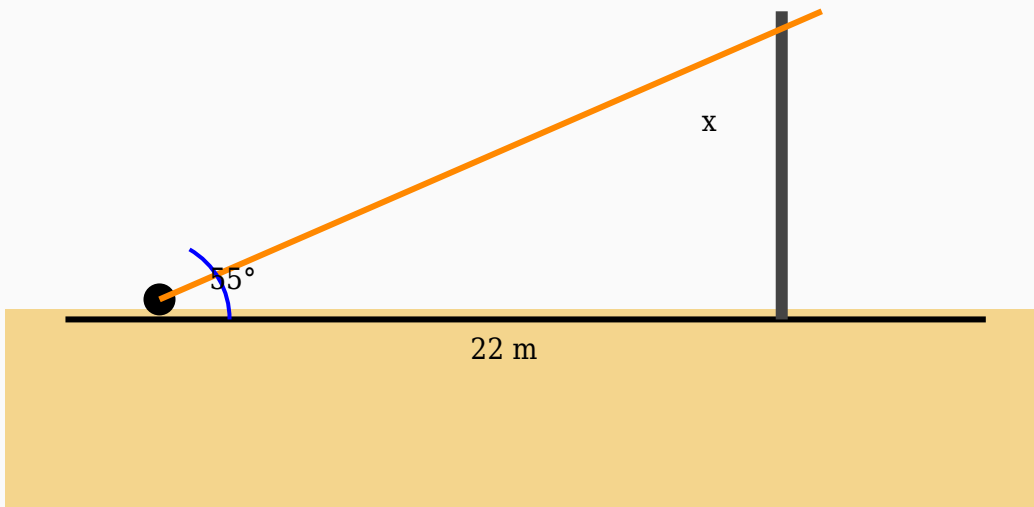
$\text{Height} = 41 \times 0.84$

$\text{Height} = 34.4 \text{ m}$

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:

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

$$\tan 55^\circ = \text{Height} / 22$$

$$1.43 = \text{Height} / 22$$

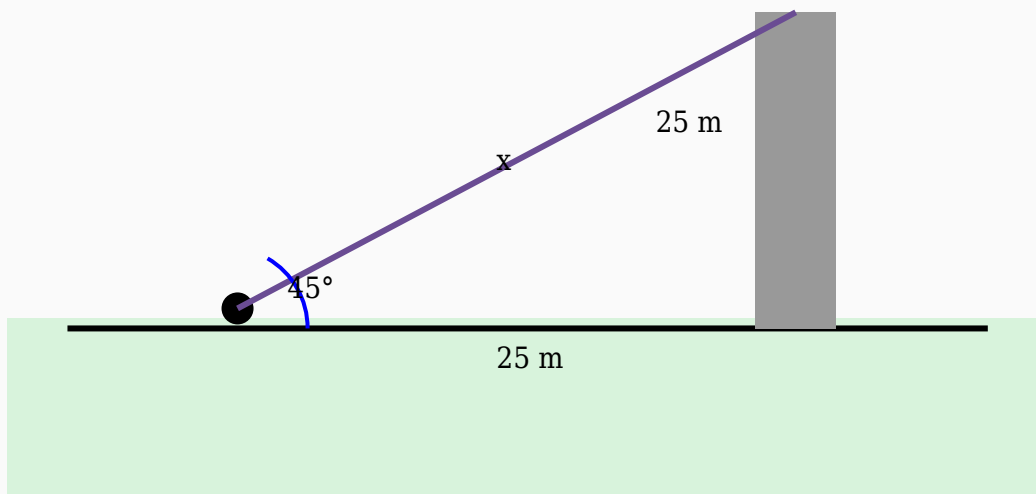
$$\text{Height} = 22 \times 1.43$$

$$\text{Height} = 31.42 \text{ m}$$

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:

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

$$\cos 45^\circ = 25 / \text{Hypotenuse}$$

$$0.71 = 25 / \text{Hypotenuse}$$

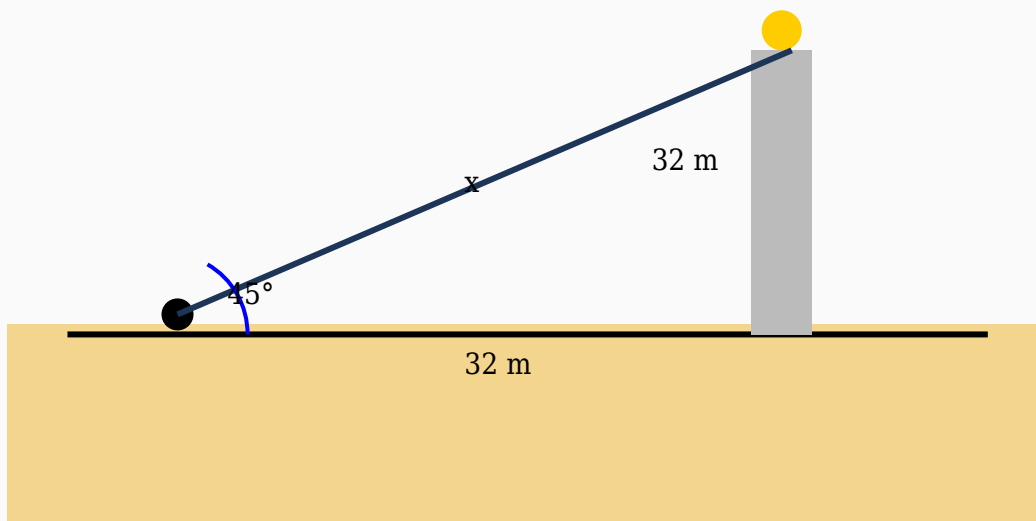
$$\text{Hypotenuse} = 25 / 0.71$$

$$\text{Hypotenuse} = 35.21 \text{ m}$$

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:

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

$\cos 45^\circ = 32 / \text{Hypotenuse}$

$0.71 = 32 / \text{Hypotenuse}$

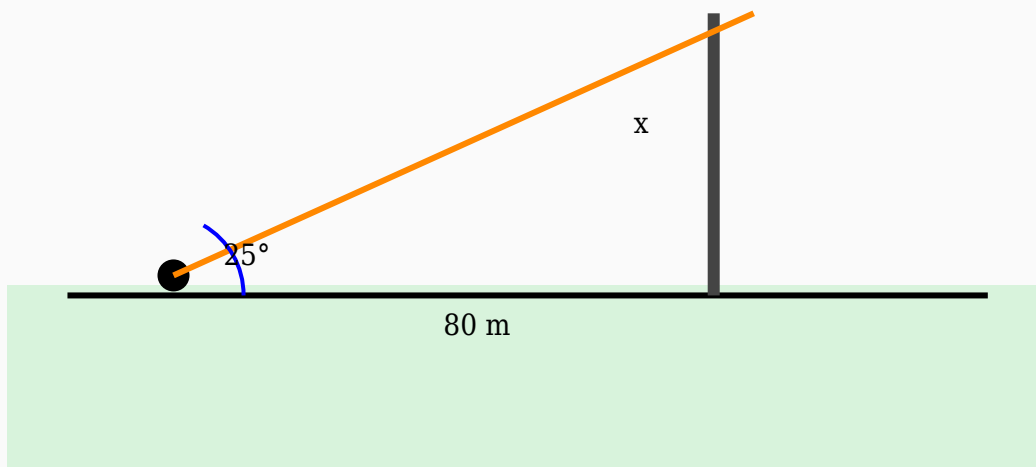
$\text{Hypotenuse} = 32 / 0.71$

$\text{Hypotenuse} = 45.07 \text{ m}$

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:

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

$\tan 25^\circ = \text{Height} / 80$

$0.47 = \text{Height} / 80$

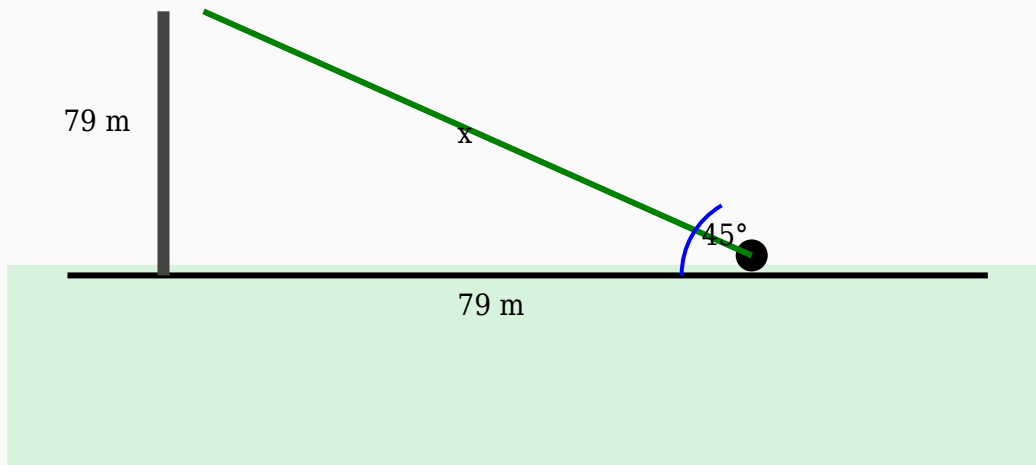
$\text{Height} = 80 \times 0.47$

$\text{Height} = 37.3 \text{ m}$

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:

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

$\cos 45^\circ = 79 / \text{Hypotenuse}$

$0.71 = 79 / \text{Hypotenuse}$

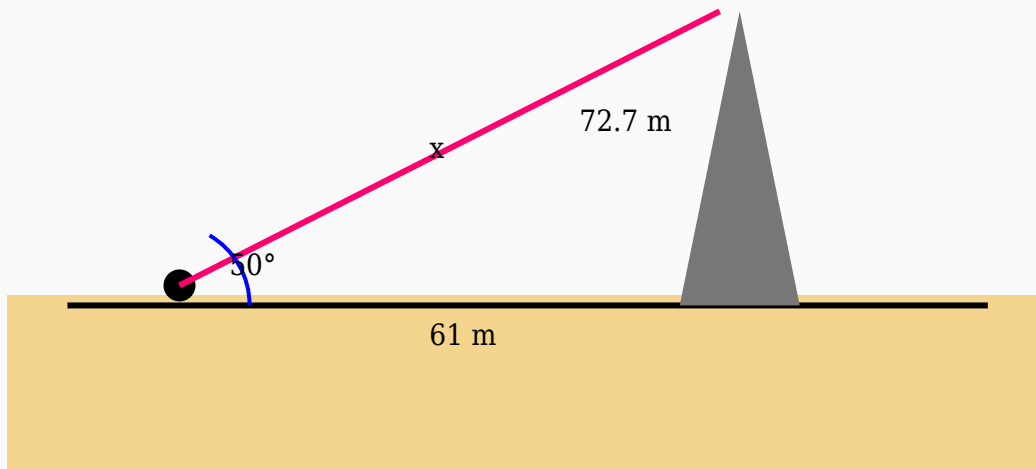
$\text{Hypotenuse} = 79 / 0.71$

$\text{Hypotenuse} = 111.27 \text{ m}$

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:

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

$$\cos 50^\circ = 61 / \text{Hypotenuse}$$

$$0.64 = 61 / \text{Hypotenuse}$$

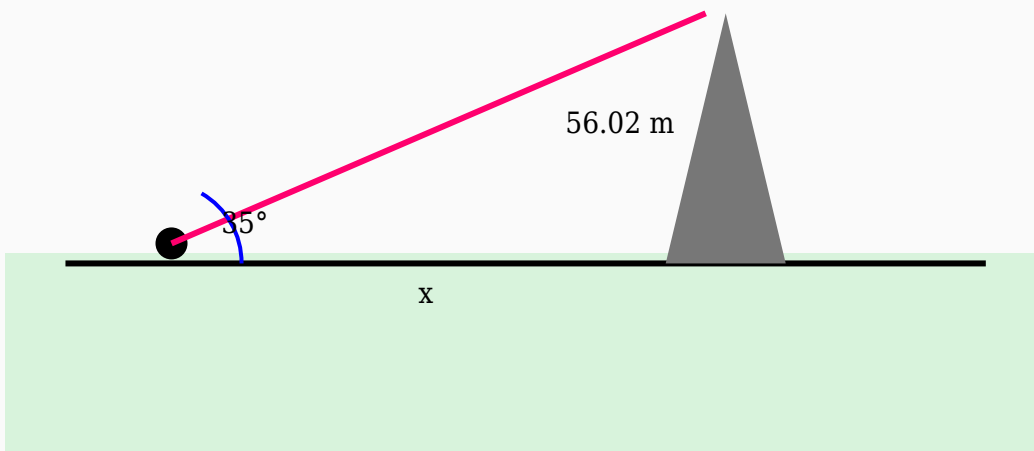
$$\text{Hypotenuse} = 61 / 0.64$$

$$\text{Hypotenuse} = 95.31 \text{ m}$$

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:

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

$\tan 35^\circ = 56.02 / \text{Distance}$

$0.7 = 56.02 / \text{Distance}$

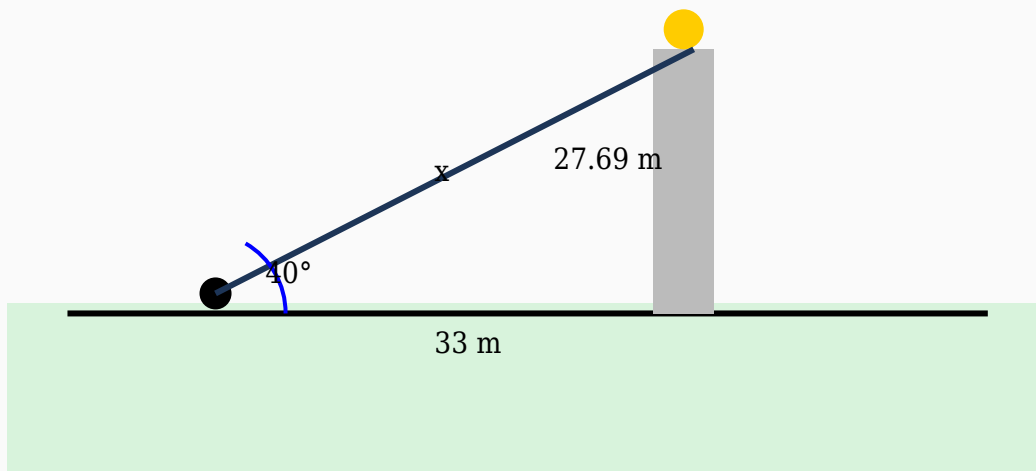
$\text{Distance} = 56.02 / 0.7$

$\text{Distance} = 80.03 \text{ m}$

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:

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

$\cos 40^\circ = 33 / \text{Hypotenuse}$

$0.77 = 33 / \text{Hypotenuse}$

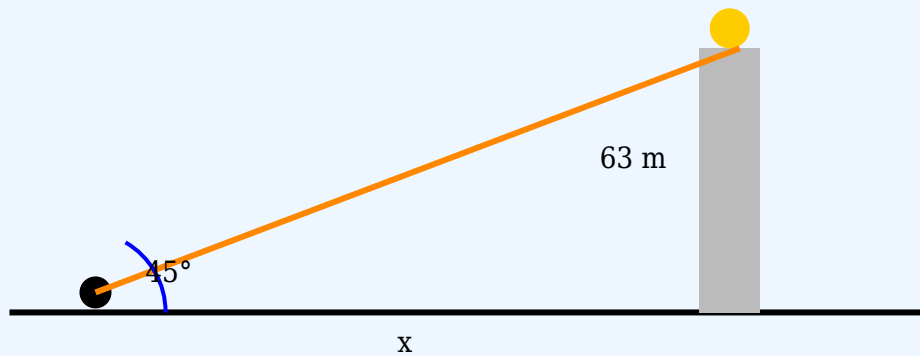
$\text{Hypotenuse} = 33 / 0.77$

$\text{Hypotenuse} = 42.86 \text{ m}$

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:

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

$\tan 45^\circ = 63 / \text{Distance}$

$1 = 63 / \text{Distance}$

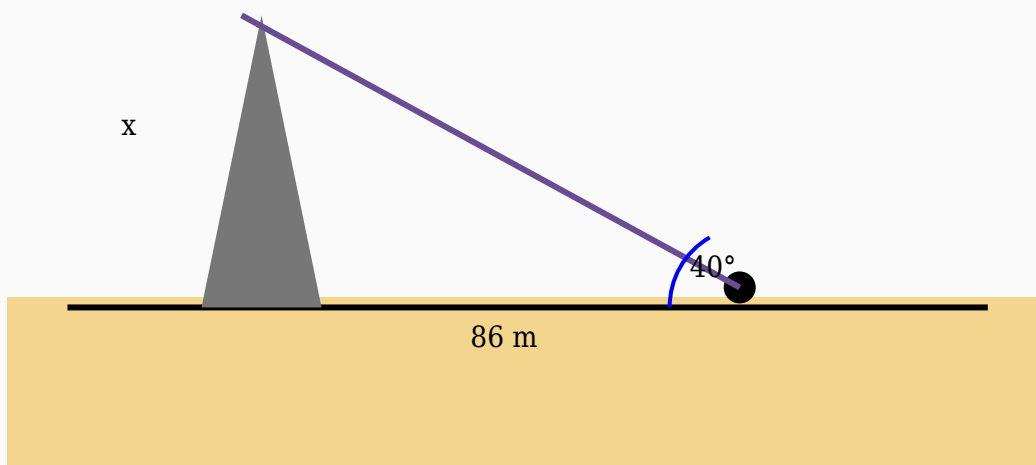
$\text{Distance} = 63 / 1$

$\text{Distance} = 63 \text{ m}$

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:

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

$\tan 40^\circ = \text{Height} / 86$

$0.84 = \text{Height} / 86$

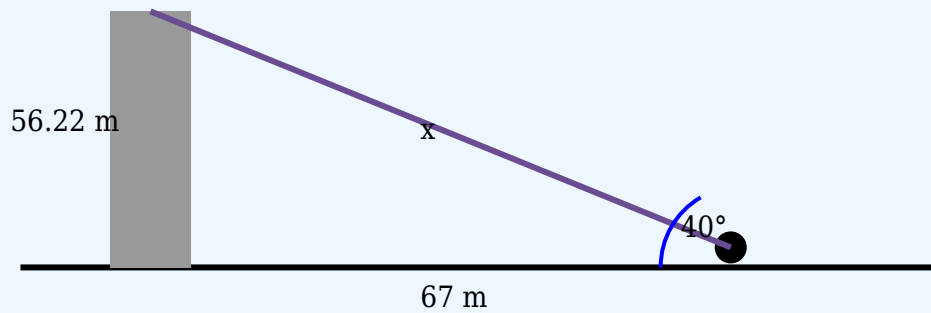
$\text{Height} = 86 \times 0.84$

$\text{Height} = 72.16 \text{ m}$

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:

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

$\cos 40^\circ = 67 / \text{Hypotenuse}$

$0.77 = 67 / \text{Hypotenuse}$

$\text{Hypotenuse} = 67 / 0.77$

$\text{Hypotenuse} = 87.01 \text{ m}$

Answer: 87.01 m