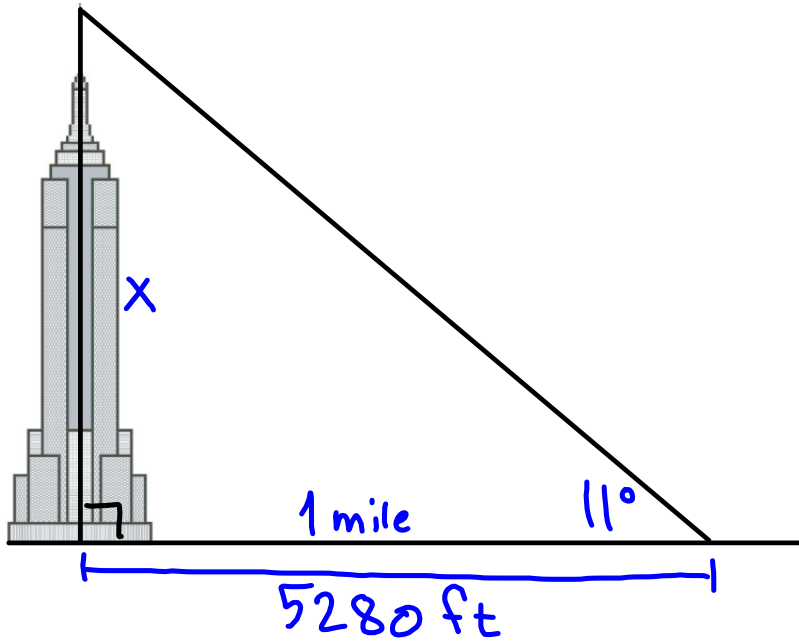6. The angle of elevation to the top of the Empire State Building in New York is 11° from a point on the ground 1 mile from the base of the building. Find the height of the Empire State Building in feet.

X

1 mile   11°

5280 ft

7. A plane is flying at an elevation of 35,000 feet within sight of the Gateway Arch in St. Louis, Missouri. The pilot would like to estimate her distance from the Arch. She finds that the angle of depression to a point on the ground below the arch is 22°.
(a)What is the distance between the plane and the arch?
(b)What is the distance between a point on the ground directly below the plane and the arch? (along the ground)

22°

35,000 ft.

(a)

22°

(b)
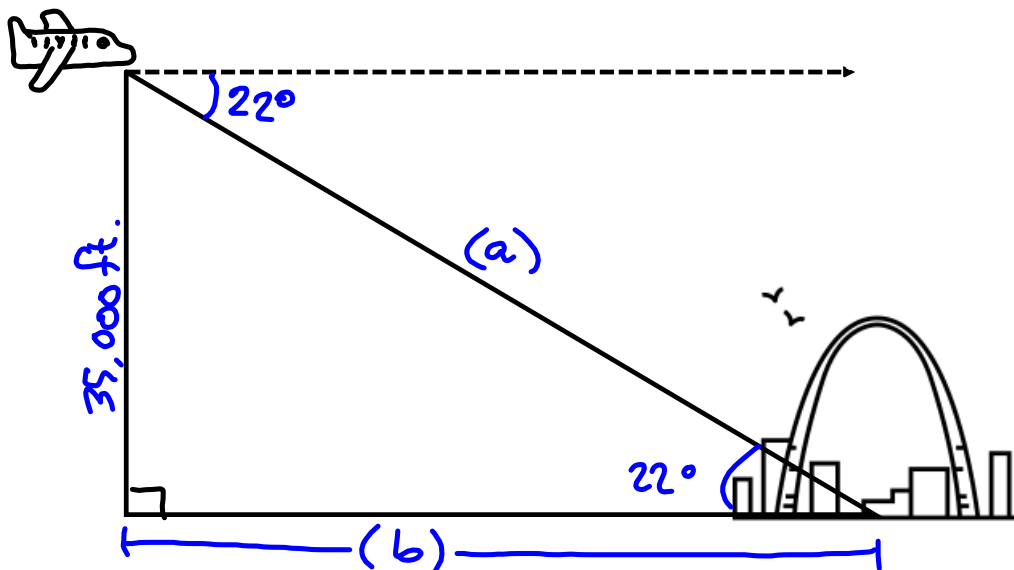
8. From the top of a 200 foot lighthouse, the angle of depression to a ship on the ocean is 23°. How far is the ship from the base of the lighthouse?


23°

200 ft

23°

x
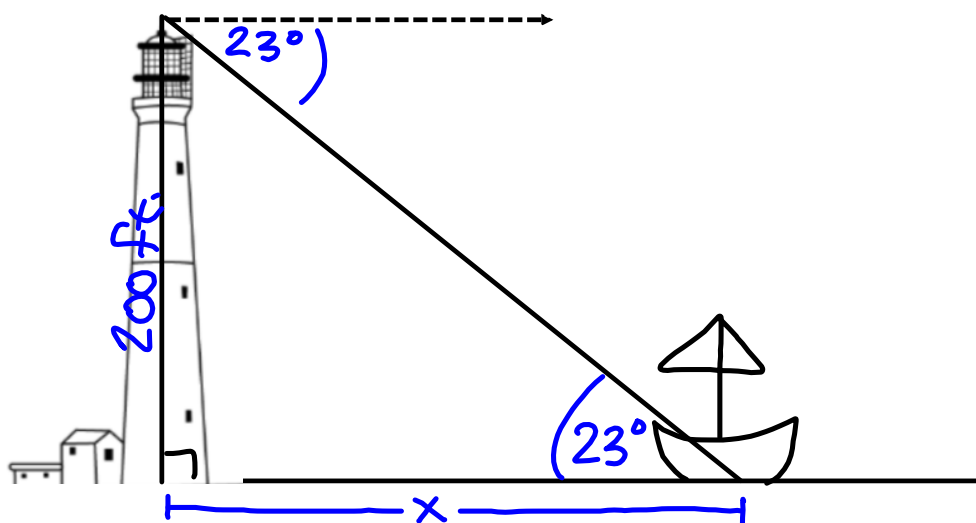
9.   A 20 foot ladder leans against a building so that the angle between the ground and the ladder is 72°. How high does the ladder reach on the building?

20´

x

72°
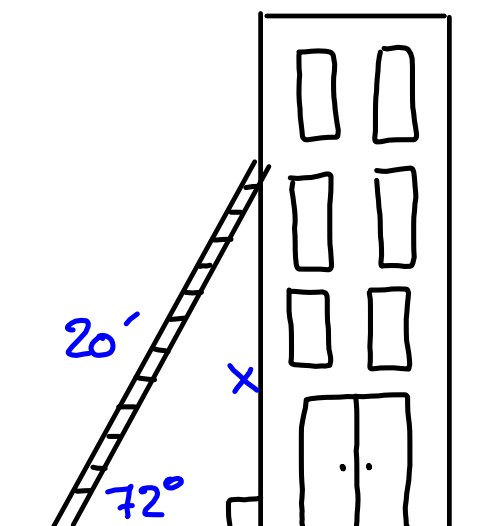
10. A 96 foot tree casts a shadow that is 120 feet long. What is the angle of elevation of the sun?


96 ft.

120 ft

θ
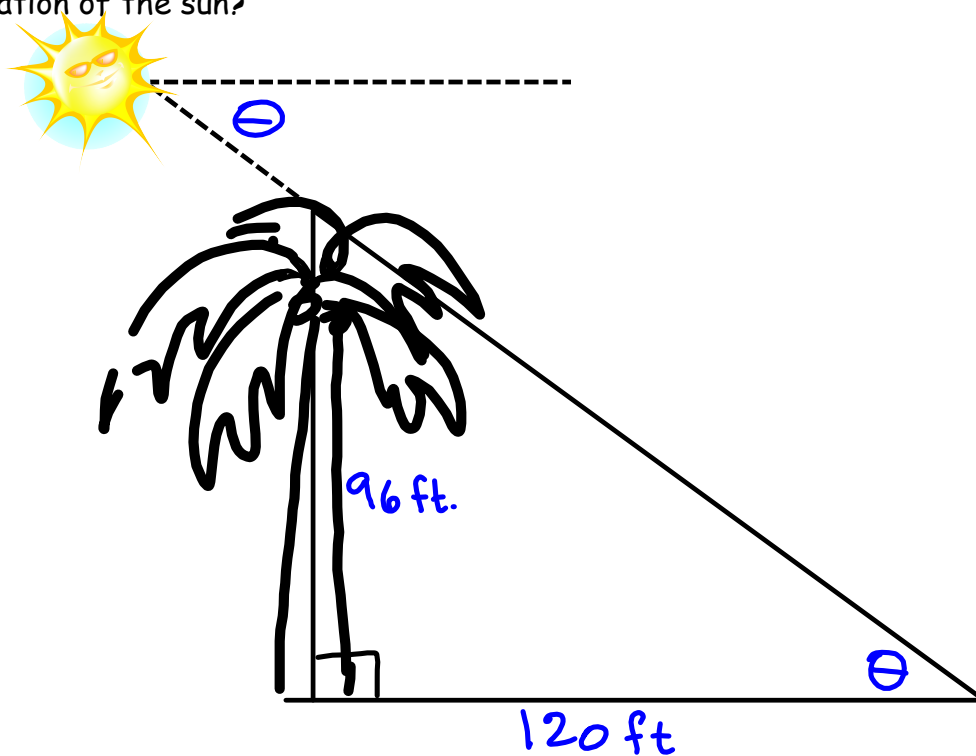
11. A man is lying on the beach, flying a kite. He holds the end of the kite string at ground level and estimates the angle of elevation of the kite to be 50°. If the string is 450 feet long, how high is the kite above the ground?

PHS

450

x

50°
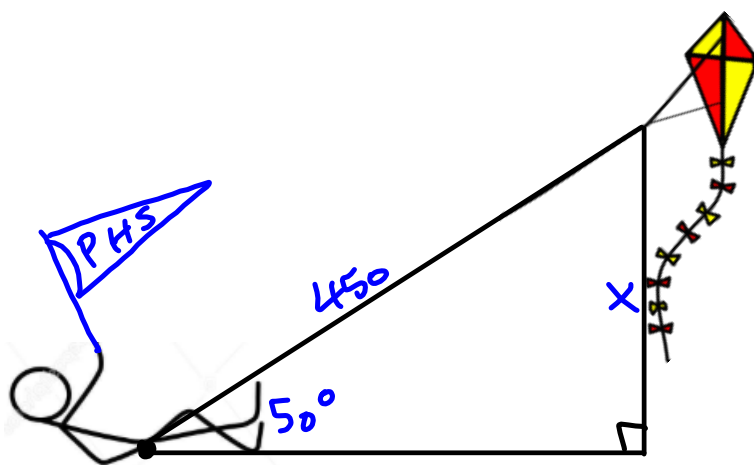
12. From a point 100 feet in front of a public library, the angles of elevation to the base of the flagpole and to the top of the flagpole are 28° and 39°45', respectively. The flagpole is mounted on the roof of the library. Find the height of the flagpole.

x

b+f

LIBRARY

39°45' b

28°

100 ft.
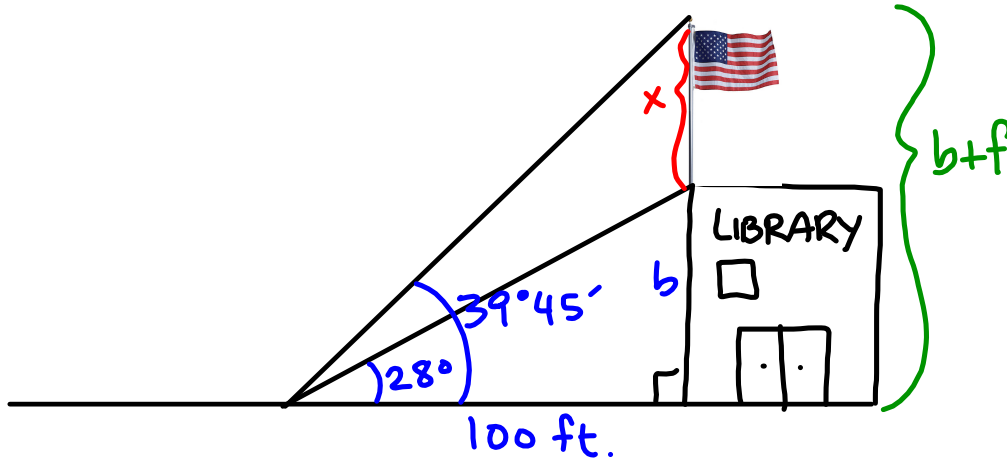
13. The altitude of an equilateral triangle is 5 cm. What is the length of a side of the triangle?

60°

60°   60°

x

5cm

60°
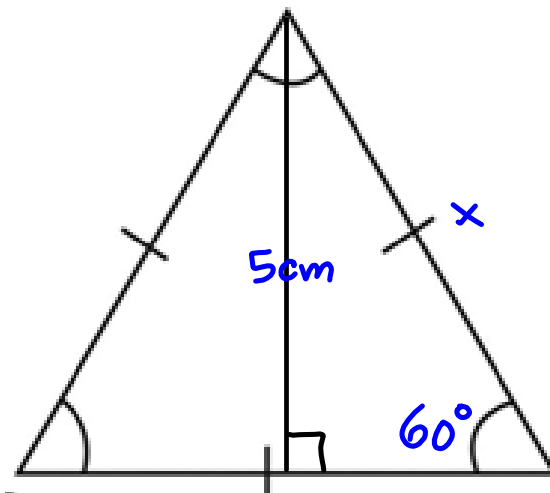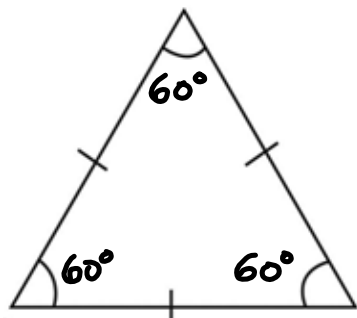
14. Find the altitude of an isosceles triangle with base 4.24 feet. The vertex angle of the triangle measures 85°.
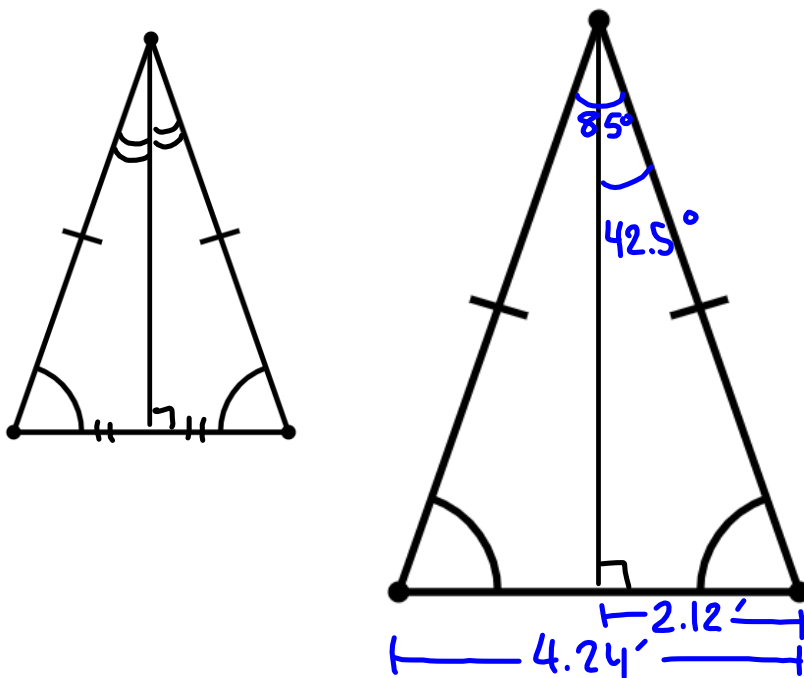
15. A builder wishes to construct a ramp 24 feet long that rises to a height of 5 feet above the ground. Find the angle of elevation of the ramp.