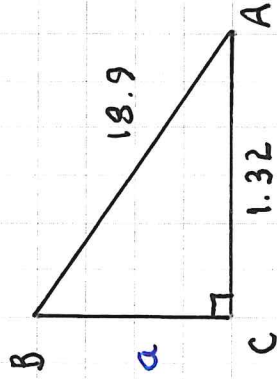


Pg 332, #12 Solve the triangle.



$$A = 86^\circ$$

$$a = 18.85$$

$$B = 4^\circ$$

$$b = 1.32$$

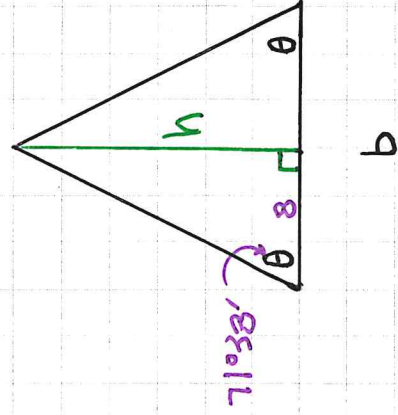
$$C = 90^\circ$$

$$c = 18.9$$

$$1) \text{ Find } a: a^2 + b^2 = c^2 \Rightarrow a^2 = 18.9^2 - 1.32^2 \Rightarrow a = \sqrt{\quad} = 18.85$$

$$2) \text{ Find } B: \sin B = \frac{1.32}{18.9} \Rightarrow B = \sin^{-1}\left(\frac{1.32}{18.9}\right) = 4^\circ$$

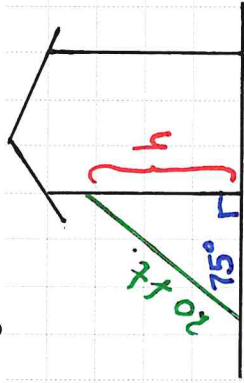
$$3) \text{ Find } A = 90^\circ - B = 86^\circ$$

Pg. 332, #17 Find the altitude given that  $\theta = 71^\circ 38'$  and  $b = 16$  m.

$$\text{Now } \tan 71^\circ 38' = \frac{h}{8} \Rightarrow h = 8 \tan 71^\circ 38'$$

$$h = 24.1 \text{ m}$$

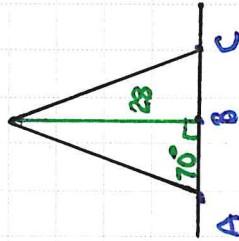
19. **Home Maintenance** A ladder that is 20 feet long leans against the side of a house. The angle of elevation of the ladder is  $75^\circ$ . Find the height from the top of the ladder to the ground.



$$\text{Now, } \sin 75^\circ = \frac{h}{20}$$

$$\Rightarrow h = 20 \sin 75^\circ = \boxed{19.3 \text{ ft}}$$

22. **Architecture** The front of an A-frame cottage has the shape of an isosceles triangle. It stands 28 feet high and the angle of elevation of its roof is  $70^\circ$ . What is the width of the cottage at its base?

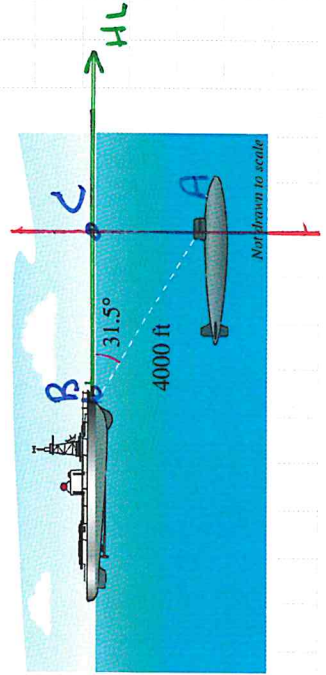


$$\text{Find: } AC = 2AB$$

$$\text{Now, } \tan 70^\circ = \frac{28}{AB} \Rightarrow AB = \frac{28}{\tan 70^\circ}$$

$$\text{So } AC = 2 \left( \frac{28}{\tan 70^\circ} \right) = \boxed{20.38 \text{ ft}}$$

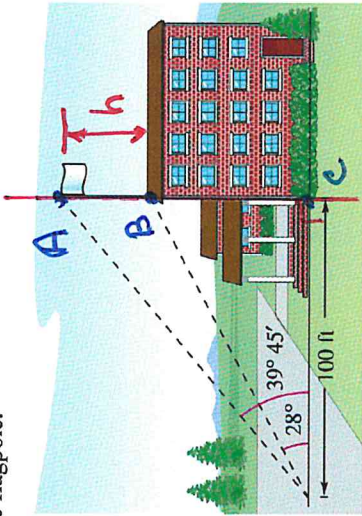
23. **Angle of Depression** The sonar of a navy cruiser detects a submarine that is 4000 feet from the cruiser. The angle between the water level and the submarine is  $31.5^\circ$  (see figure). How deep is the submarine?



$$\text{Now } \sin 31.5^\circ = \frac{AC}{4000}$$

$$\Rightarrow AC = 4000 \sin 31.5^\circ = \boxed{2090 \text{ ft.}}$$

25. **Finding a Height** From a point 100 feet in front of a public library, the angles of elevation to the base of the flagpole and the top of the flagpole are  $28^\circ$  and  $39^\circ 45'$ , respectively (see figure). Find the height of the flagpole.



$$\text{Find } AB = AC - BC$$

$$\text{Now } \tan 39^\circ 45' = \frac{AC}{100}$$

$$\Rightarrow AC = 100 \tan 39^\circ 45'$$

$$\text{and } BC = 100 \tan 28^\circ$$

$$\text{So } AC = \boxed{80 \text{ ft.}}$$

28. **Aviation** A passenger in an airplane flying at an altitude of 10 kilometers sees two towns due east of the plane. The angles of depression to the towns are  $28^\circ$  and  $55^\circ$  (see figure). How far apart are the towns?

