10.18 Unit Test: Trigonometry **HSG.SRT.C.8**

1. As shown, right $\triangle ABC$ has $AC = 5, BC = 12, AB = 13$, $\text{m}\angle C = 90°$.

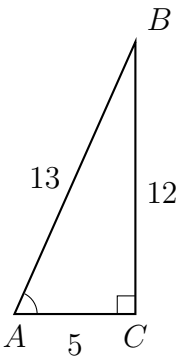
   Express each trigonometric ratio as a fraction.

   (a) $\sin A =$

   (b) $\cos A =$

   (c) $\tan A =$

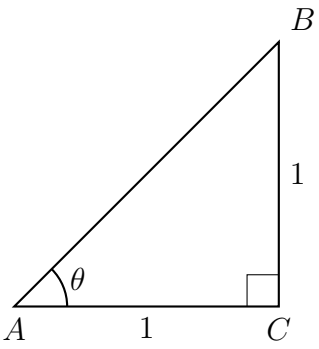
   (d) Find the angle measure of $\angle A$ rounded to the *nearest whole degree*.



2. Isosceles right $\triangle ABC$ is shown with legs $AC = BC = 1$ as marked.

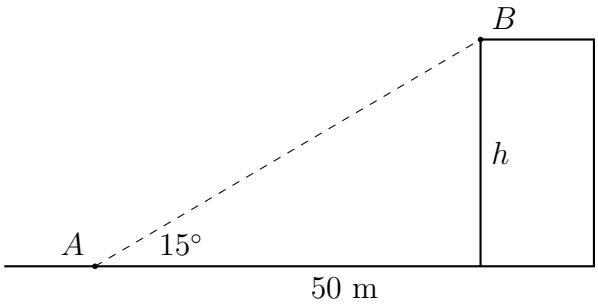
   (a) Write down θ.

   (b) Find the length of hypotenuse AB as an exact expression.



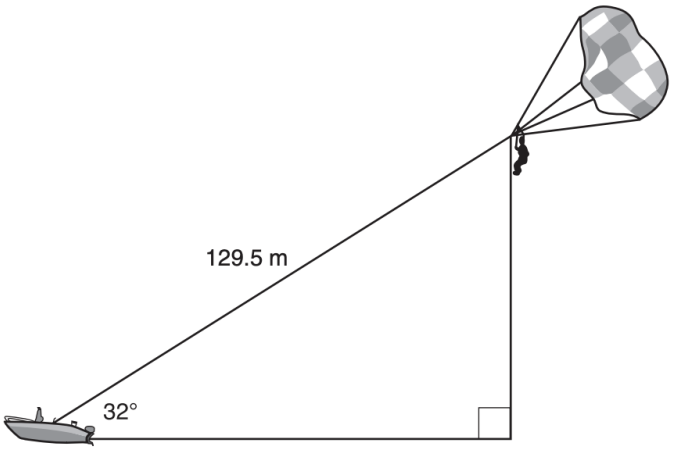
3. At an angle of elevation of 15°, the top of a structure B is visible from point A on the ground 50 meters away, as shown below.

   Find the height h of the structure to the *nearest tenth of a meter*. (not to scale)



4. A 15-foot ladder leans against a building and reaches a window 12 feet above ground. What is the measure of the angle, to the *nearest degree*, that the ladder forms with the ground?

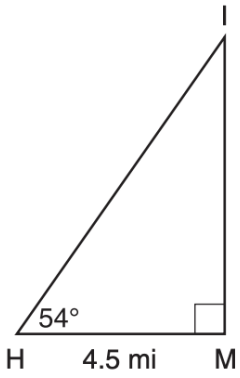
5. A man was parasailing above a lake at an angle of elevation of 32° from a boat, as modeled in the diagram below.



   If 129.5 meters of cable connected the boat to the parasail, approximately how many meters above the lake was the man? (to the *nearest tenth of a meter*)

6. Regents problem

As shown in the diagram below, an island (I) is due north of a marina (M). A boat house (H) is 4.5 miles due west of the marina. From the boat house, the island is located at an angle of 54° from the marina.



Determine and state, to the *nearest tenth of a mile,* the distance from the boat house (H) to the island (I).

Determine and state, to the *nearest tenth of a mile,* the distance from the island (I) to the marina (M).