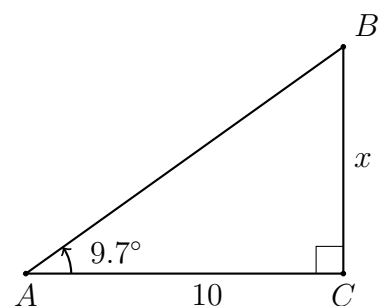


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**6.15 Exam: Tangent applications****CCSS.HSG.SRT.C.8**

1. Given right  $\triangle ABC$  with  $AC = 10$ ,  $m\angle A = 40^\circ$ . Find the value of  $BC = x$ .



2. Graph and label  $\triangle ABC$  with  $A(0,0)$ ,  $B(5,3)$ , and  $C(5,0)$ . Calculate the length of each side of the triangle.

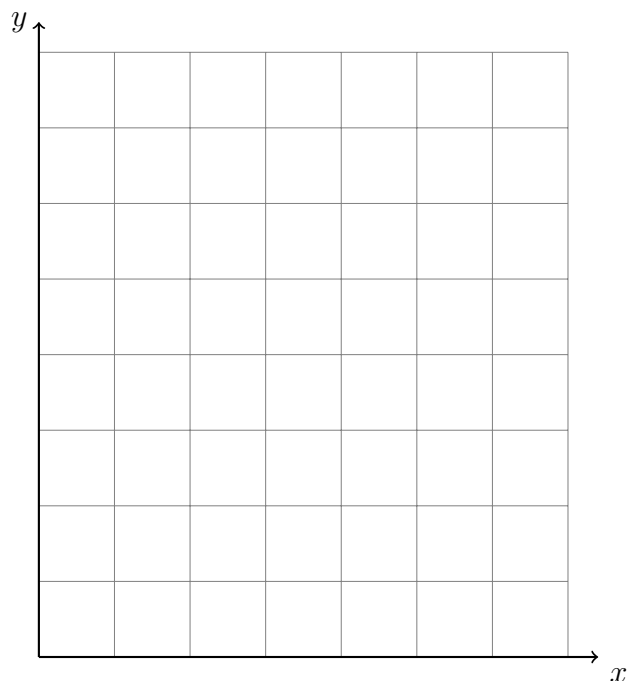
(a)  $AC =$

(b)  $BC =$

- (c) Express first as a radical, then approximate with a decimal rounded to two decimal places.

(hint: use the Pythagorean theorem  $a^2 + b^2 = c^2$ )

$AB =$



- (d) Find the slope of each line.

$m_{AB} =$

$m_{AC} =$

$m_{BC} =$

3. Calculate each value. Round to the nearest thousandth.

(a)  $\tan 39^\circ$

(b)  $\tan 11^\circ$

4. Find  $\theta$ . Round to the nearest whole degree.

(a)  $\theta = \tan^{-1}\left(\frac{3}{10}\right)$

(b)  $\tan \theta = \frac{2.6}{4.9}$

5. Convert radians and degrees. (nearest whole degree, nearest hundredth radian).

(a)  $85^\circ =$

(b)  $1.15 \text{ radians} =$

6. Solve each equation for  $x$ , rounding to the nearest hundredth.

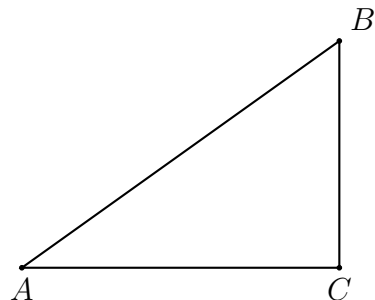
(a)  $\tan 33^\circ = \frac{x}{21}$

(b)  $\tan 16^\circ = \frac{3.7}{x}$

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7. Given right  $\triangle ABC$  with  $\overline{AC} \perp \overline{BC}$ ,  $BC = 6$ ,  $m\angle B = 50^\circ$ . Let  $x = AC$ .

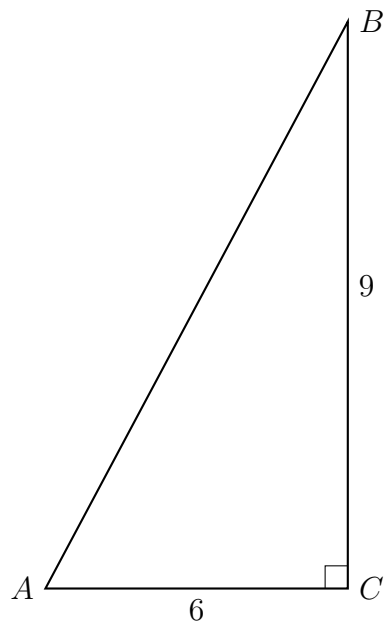


8.  $\triangle ABC$  is shown with  $m\angle C = 90^\circ$  and the lengths of the triangle's sides are  $AC = 6$ ,  $BC = 9$ .  
(not drawn to scale)

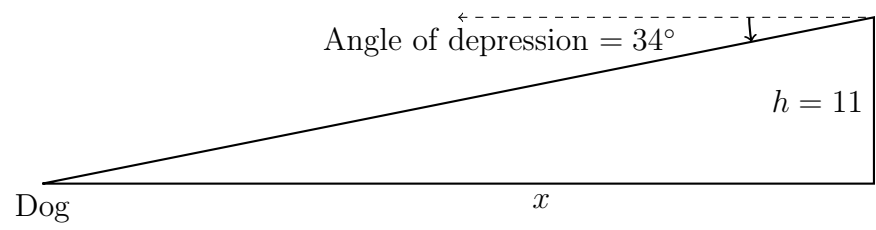
(a) Write down the value of  $\tan A$ .

(b) Find the measure of  $\angle A$ .

(c) Find  $AB$ .



9. From the top of a hill a dog is visible at an angle of depression of  $34^\circ$ . If the hill is 11 meters tall, determine the distance from the dog to the base of the hill,  $x$ , to the nearest foot.



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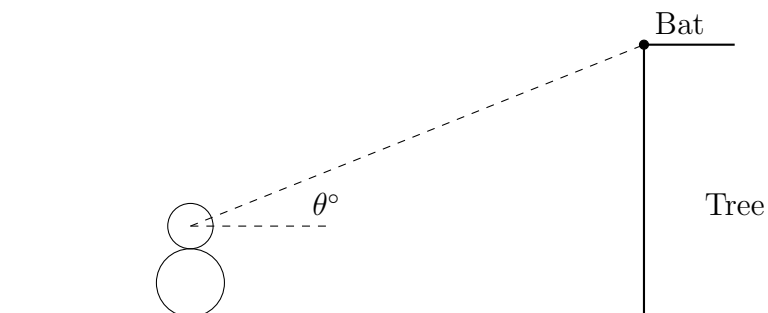
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10. A bear is standing 22 feet away from the base of a tree, looking up at a bat 16 feet off the ground. The bear is 5 feet tall.

(a) Mark the scenario.

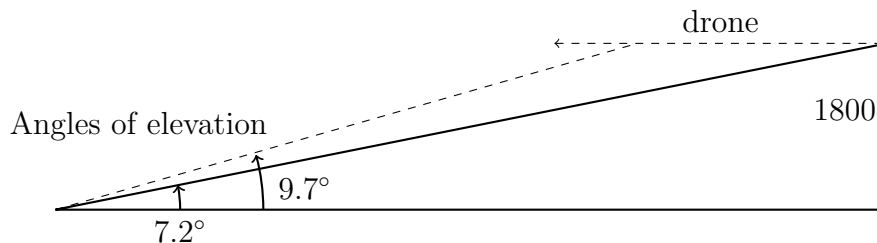
(b) Find the angle from the bear's head to the bat,  $\theta$ , to the nearest tenth degree.

(not drawn to scale)

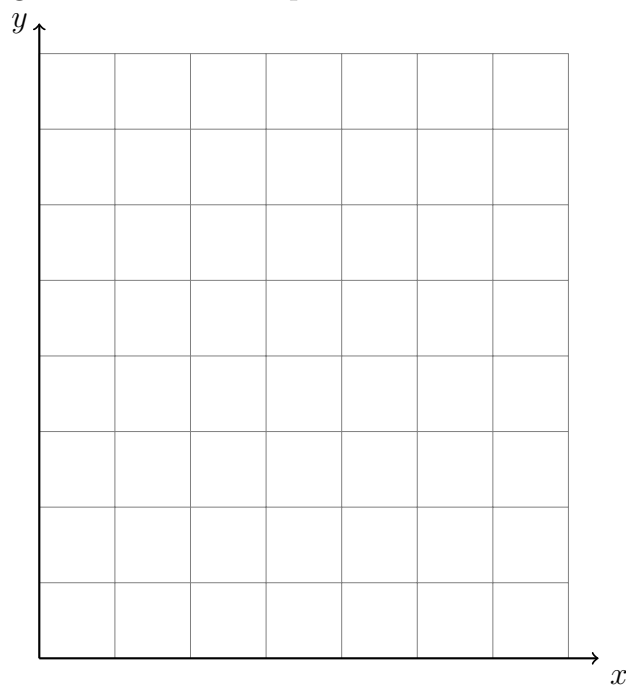


11. A drone flying at an altitude of 1,800 meters is observed twice. The first time the angle of elevation is  $7.2^\circ$  and exactly one minute later the angle of elevation is  $9.7^\circ$ .

Find the distance the drone flies over the minute and its speed in kilometers per hour.



12. Challenge: A square is partitioned into two rectangles. The sum of the perimeters of the



two rectangles is 36. Find the area of the square.