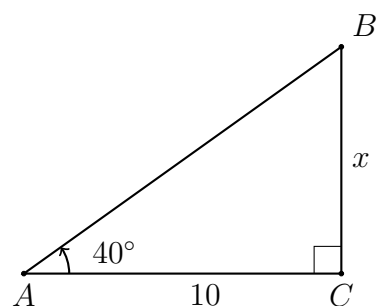


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6.15 Exam: Tangent applications**CCSS.HSG.SRT.C.8**

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.

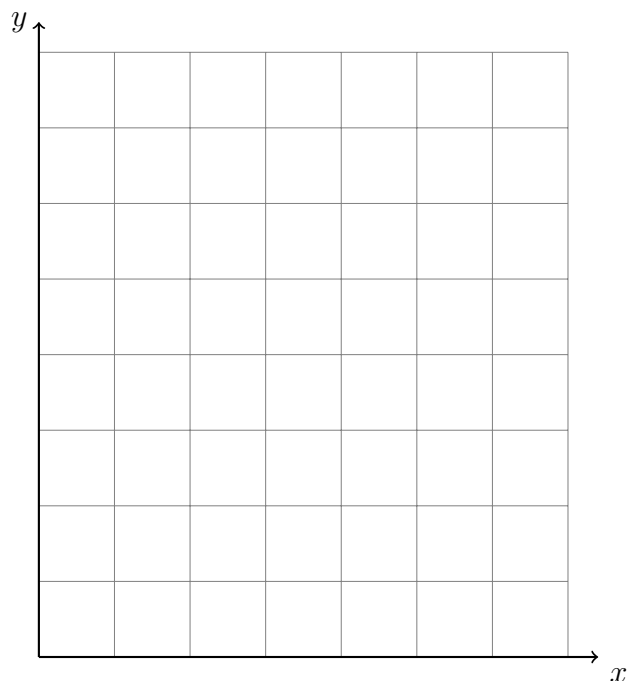
(a) $AC =$

(b) $BC =$

- (c) For the hypotenuse, express the length as a radical, then round to the nearest hundredth.

(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 θ . 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 tenth.

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

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

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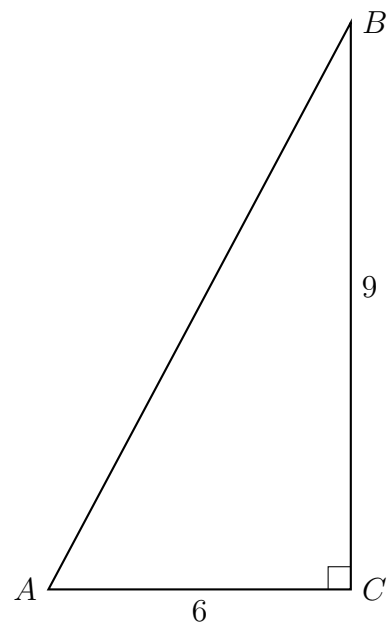
7. $\triangle ABC$ is shown with $m\angle C = 90^\circ$ and the lengths of the triangle's sides are $AC = 6$, $BC = 9$. (not drawn to scale)

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

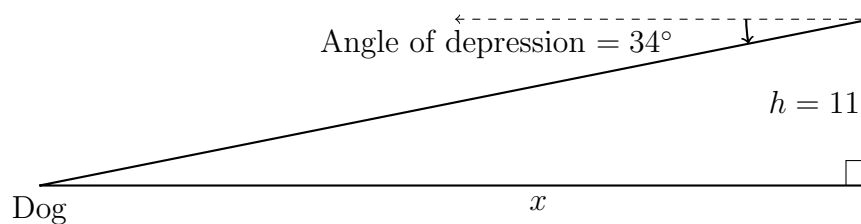
(b) Find the measure of $\angle A$.

(c) Write down the value of $\tan B$.

(d) Find the measure of $\angle B$.



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

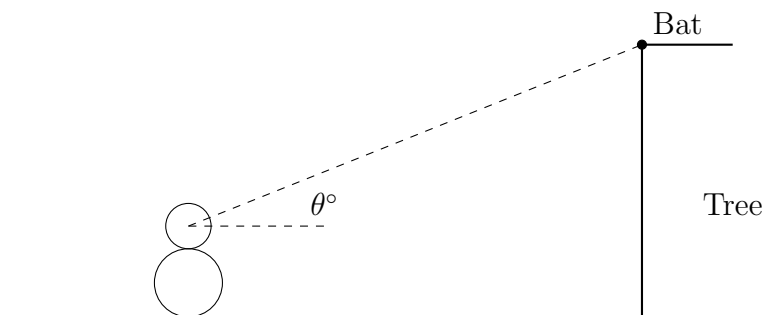


9. A bear is standing 22 feet away from the base of a tree, looking up at a bat 16 feet off the ground. The bear is 5 feet tall.

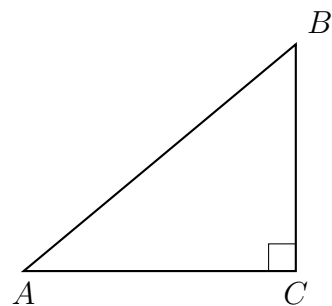
(a) Mark the scenario.

- (b) Find the angle of elevation the bear views the bat, θ , to the nearest tenth degree.

(not drawn to scale)



10. The right $\triangle ABC$ has a base of $AC = 6$ units. The area of the triangle is 15 square units. Find the lengths of all three sides and measures of all angles of the triangle. (“solve the triangle”)



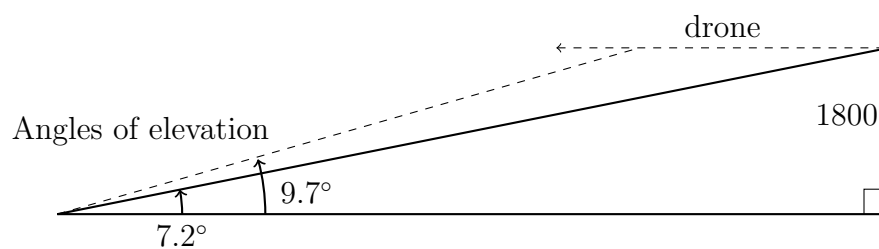
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11. A drone flying at an altitude of 1,800 meters is observed twice. The first time the angle of elevation is 7.2° and exactly one minute later the angle of elevation is 9.7° .

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

(not drawn to scale)



12. A square is partitioned into two rectangles. The sum of the perimeters of the two rectangles is 36. Find the area of the square.

