

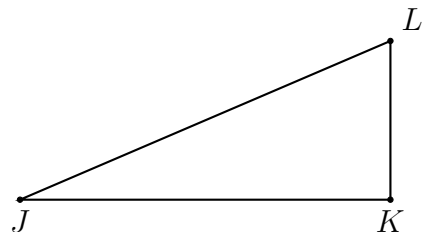
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**6.9 Classwork: Solving triangles****CCSS.HSG.SRT.C.8**

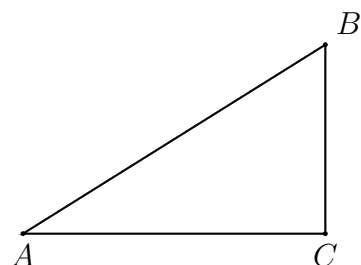
Write an equation expressing  $\tan \theta$  as a ratio of *opposite* over *adjacent*, then solve for the missing length.

1. Given right  $\triangle JKL$  with  $\overline{JK} \perp \overline{KL}$ ,  $JK = 8$ ,  $m\angle J = 24^\circ$ . Let  $x$  be the length of the side opposite  $\angle J$ ,  $x = KL$ .

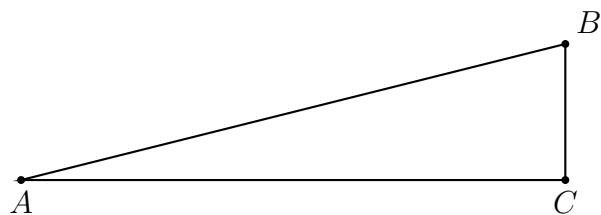


2. Given right  $\triangle ABC$  with  $m\angle C = 90^\circ$ ,  $BC = 15$ ,  $m\angle A = 41^\circ$ .

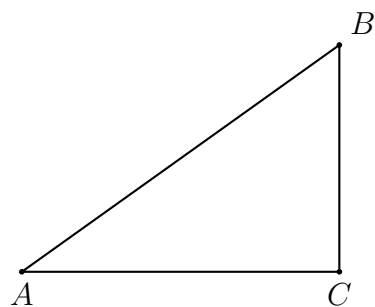
- (a) Solve for  $x = AC$ .
- (b) Find the length of the hypotenuse  $AB$  using the Pythagorean theorem.



3. Given right  $\triangle ABC$  with  $m\angle C = 90^\circ$ ,  $BC = 4$ ,  $AC = 19$ , and  $m\angle A = x^\circ$ .



4. Given right  $\triangle ABC$  with  $\overline{AC} \perp \overline{BC}$ ,  $BC = 7$ ,  $m\angle B = 55^\circ$ . Let  $x = AC$ .



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**Mastery topic: Algebraic solution**5. Solve each equation for  $x$ , rounding to the nearest hundredth.

(a)  $\tan 63^\circ = \frac{x}{14}$

(c)  $\tan 46^\circ = \frac{x}{3.5}$

(b)  $\tan 77^\circ = \frac{10}{x}$

(d)  $\tan 35^\circ = \frac{21}{x}$

6. Solve for  $x$ , rounding to the nearest whole degree.

(a)  $\theta = \tan^{-1}\left(\frac{12}{5}\right)$

(b)  $\tan \theta = \frac{3.2}{4.8}$

**Mastery topic: Calculator use**

7. Express the result to the nearest thousandth. Angle measures are in radians.

(a)  $\tan \frac{\pi}{4} =$

(c)  $\tan \frac{\pi}{6} =$

(b)  $\tan \frac{\pi}{3} =$

(d)  $\tan \frac{\pi}{12} =$

8. Find each value in radians, rounding to the nearest thousandths.

(a)  $\tan^{-1}(1) =$

(b)  $\tan^{-1}(\sqrt{3}) =$

9. Convert between radians and degrees. Leave radians in terms of  $\pi$ .

(a)  $45^\circ =$

(b)  $\frac{\pi}{6} =$

10. Round each value to the nearest hundredth.

(a)  $AB = \sqrt{11^2 + 7^2}$

(c)  $AB = \sqrt{(-8.0)^2 + (14.5)^2}$

(b)  $AB = \sqrt{3.2^2 + 1.9^2}$

(d)  $AB = \sqrt{(4-3)^2 + (7-11)^2}$