6.8 Classwork: Tangent triangle practice

CCSS.HSG.SRT.C.8

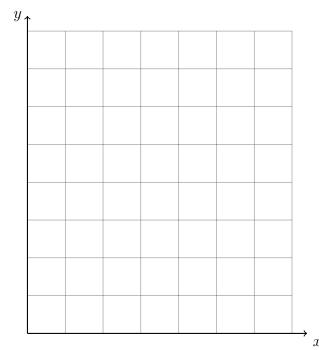
1. Graph and label $\triangle ABC$ with A(0,0), B(3,6), and C(3,0). Calculate each value:

(a) AC =

(b) BC =

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

$$AB =$$



(d) Use a protractor to measure $m \angle BAC = \theta$ in degrees.

(e) The tangent of an angle is the ratio of the side lengths *opposite* over *adjacent* to the angle. Write down the value as a fraction.

$$\tan \theta =$$

(f) Find $m \angle BAC = \theta$ in degrees with a calculator's inverse tangent function. $\theta = \tan^{-1}(\frac{opp}{adj})$

(g) Convert θ to radians. (180° = π radians)

Mastery topic: Calculator use

2. Express the result to the nearest thousandth.

(a)
$$\tan 22^{\circ} =$$

(c)
$$\tan 15^{\circ} =$$

(b)
$$\tan 81^{\circ} =$$

(d)
$$\tan 65^{\circ} =$$

3. Round each value to the nearest degree.

(a)
$$\tan^{-1}(2) =$$

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

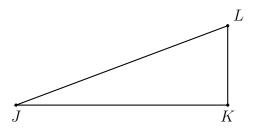
(b)
$$\tan^{-1}(0.5) =$$

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

Mastery topic: Modeling. Do Not Solve

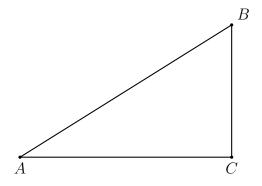
4. Given right $\triangle JKL$ with $\overline{JK} \perp \overline{KL}$, JK = 11, $m \angle J = 18^{\circ}$. (mark the diagram)

Let x be the length of the side opposite $\angle J$, x = KL. Write an equation expressing $\tan \angle J$ as a ratio of *opposite* over *adjacent*.



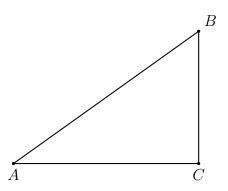
5. Given right $\triangle ABC$ with $m \angle C = 90^{\circ}$, BC = 5, $m \angle A = 38^{\circ}$. (mark the diagram)

Let x be the length of the side adjacent to $\angle A$, x = AC. Write an equation expressing $\tan \angle A$ as a ratio of *opposite* over *adjacent*.



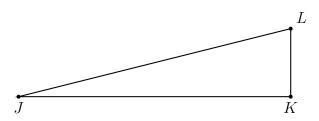
6. Given right $\triangle ABC$ with $m\angle C=90^\circ$, BC=11, AC=17, and $m\angle A=x^\circ$. (mark the diagram)

Write an equation expressing $\tan x$ as a ratio of *opposite* over *adjacent*.



7. Given right $\triangle JKL$ with $\overline{JK} \perp \overline{KL}$, JK = 20, $m \angle J = 11^{\circ}$. (mark the diagram)

Let x be the length of the side opposite $\angle J$, x = KL. Write an equation expressing $\tan \angle J$ as a ratio of *opposite* over *adjacent*.



Mastery topic: Algebraic solution

Use your calculator and solve each equation for x, rounding to the nearest tenth.

8.
$$\tan 75^{\circ} = \frac{x}{15}$$

9.
$$\tan 26^\circ = \frac{4}{x}$$

10.
$$x = \tan^{-1}(\frac{2}{3.5})$$

$$11. \, \tan x^\circ = \frac{17}{9}$$