7.6b Classwork Mastery: Tangent function (collect 8 stars for each topic)

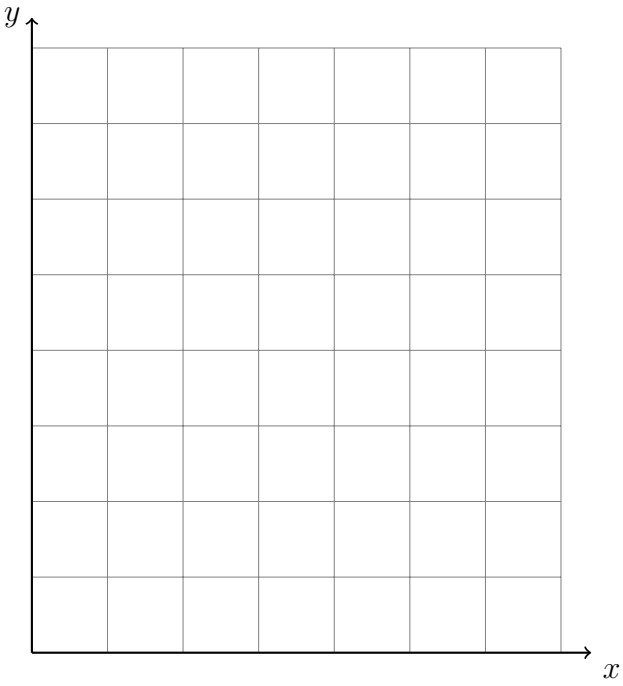
Mastery topic: Interpreting tangent graphically

1. (a) Graph and label $\triangle ABC$ with $A(0,0)$, $B(5,5)$, and $C(5,0)$. Calculate each length:

   i. $AC =$ (1 star)

   ii. $BC =$ (1 star)

   iii. $AB = \sqrt{AC^2 + BC^2}$ (2 stars)



   (b) Use a protractor to measure $\angle BAC$ in degrees. (1 star)

   (c) 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. (1 star)

   $\tan \angle BAC =$

   (d) Find $m\angle BAC$ with a calculator's inverse tangent function,
   $m\angle BAC = \tan^{-1}(\frac{opp}{adj})$ (2 stars)

Mastery topic: Algebraic solution **(2 stars each)**

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

2. $\tan 63^\circ = \dfrac{x}{14}$

4. $\sin 46^\circ = \dfrac{x}{3.5}$

3. $\tan 77^\circ = \dfrac{10}{x}$

5. $\cos 35^\circ = \dfrac{x}{21}$

Solve for x, rounding to the nearest whole degree.

6. $x = \tan^{-1}(\dfrac{12}{5})$

7. $\tan x^\circ = \dfrac{3.2}{4.8}$

Mastery topic: Calculator use

8. Express the result to the nearest thousandth. (1 star each)

   (a) $\tan 22° =$

   (b) $\tan 81° =$

   (c) $\tan 15° =$

   (d) $\tan 65° =$

9. Round each value to the nearest degree. (1 star each)

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

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

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

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

10. Round each value to the nearest hundredth. (2 stars each)

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

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

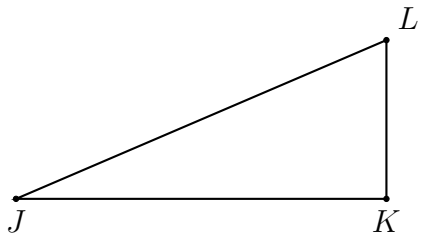
    (c) $AB = \sqrt{(-8.0)^2 + (14.5)^2}$

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

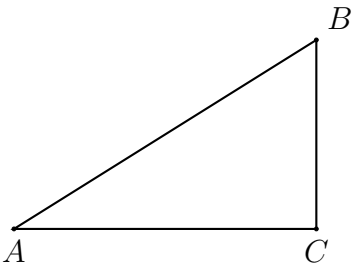
Modeling: Mark each diagram and write and equation. Do Not Solve!

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

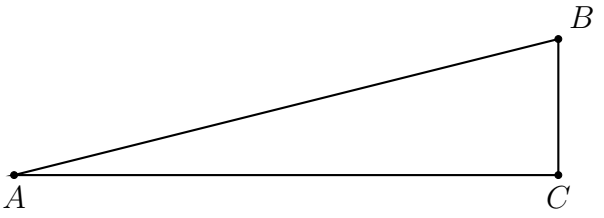
11. Given right $\triangle JKL$ with $\overline{JK} \perp \overline{KL}$, $JK = 8$, $m\angle J = 24°$. Let x be the length of the side opposite $\angle J$, $x = KL$. (2 stars)



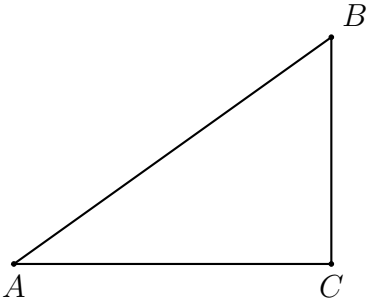
12. Given right $\triangle ABC$ with $m\angle C = 90°$, $BC = 15$, $m\angle A = 41°$. Let $x = AC$. (2 stars)



13. Given right $\triangle ABC$ with $m\angle C = 90°$, $BC = 4$, $AC = 19$, and $m\angle A = x°$. (2 stars)



14. Given right $\triangle ABC$ with $\overline{AC} \perp \overline{BC}$, $BC = 7$, $m\angle B = 55°$. Let $x = AC$. (3 stars)



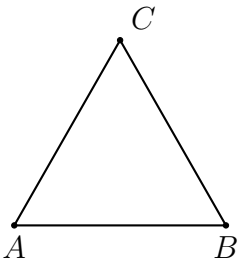
Mixed practice (test tomorrow)

Convert each equation to slope-intercept form, $y = mx + b$.

15. $3x + y = 2$ (2 stars)

16. $x - 4y = 12$ (2 stars)

17. Given $\triangle ABC$ is isosceles but not equilateral with $\angle A \cong \angle C$. (*not draw to scale*)



(a) Mark the congruent sides & angles of $\triangle ABC$.

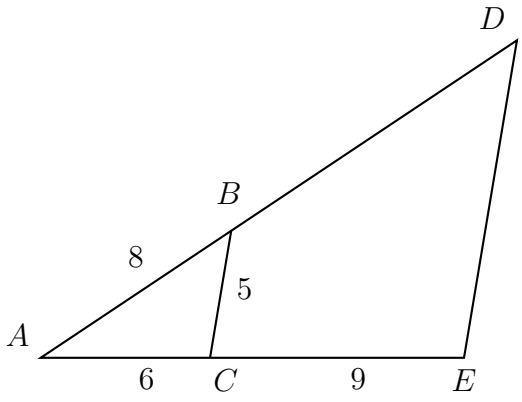
Circle True or False:

(b) True False $\overline{AB} \cong \overline{BC}$

(c) True False $\overline{AB} \cong \overline{AC}$

(d) True False $\overline{BC} \cong \overline{AC}$

18. A dilation centered at A maps $\triangle ABC \to \triangle ADE$. Given the lengths $AC = 6$, $BC = 5$, $AB = 8$, and $CE = 9$. Find AE and then the scale factor k. Then find the lengths AD and DE.



(a) $AE =$

(b) $k =$

(c) $AD =$

(d) $DE =$

19. (a) Graph and label the two equations. Mark their intersection as an ordered pair.

$y = \frac{2}{3}x - 5$ $y = -2x + 3$ (4 pts)

(b) Find the slopes of the two lines. (2 points)

$m_1 =$ $m_2 =$

(c) Are the lines parallel, perpendicular, or neither? Justify your answer with an equation or inequality using the slopes. (2 points)