

7 January 2020

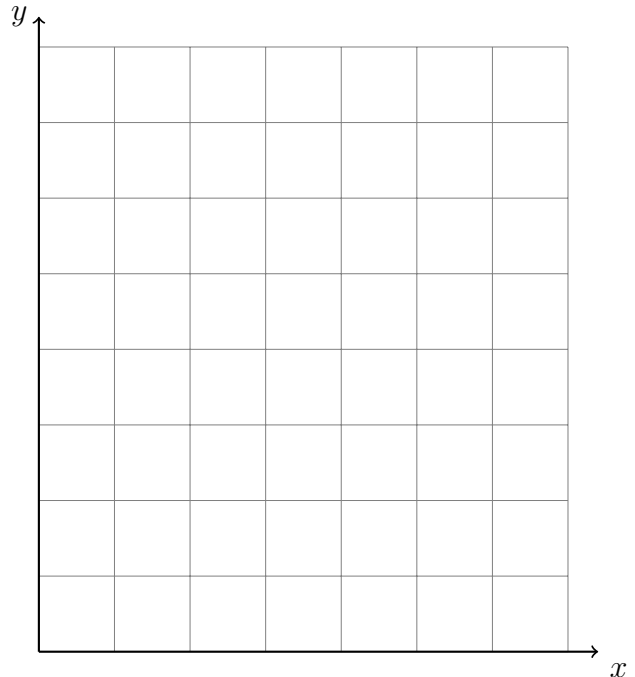
**7.4b Classwork Mastery: Tangent function (collect 8 stars for each topic)****Mastery topic: Interpreting tangent graphically**

1. (a) Graph and label  $\triangle ABC$  with  $A(0, 0)$ ,  $B(4, 7)$ , and  $C(4, 0)$ . 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,  
 $m\angle BAC = \tan^{-1}\left(\frac{opp}{adj}\right)$  (2 stars)

**Mastery topic: Calculator use**

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

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

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

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

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

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

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

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

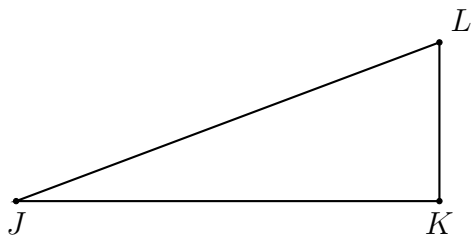
(b)  $\tan^{-1}(0.5) =$

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

**Mastery topic: Modeling. Do Not Solve**

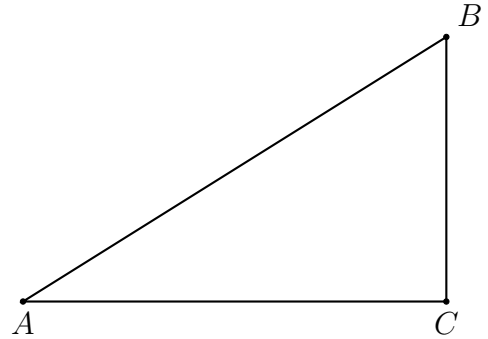
4. Given right  $\triangle JKL$  with  $\overline{JK} \perp \overline{KL}$ ,  $JK = 11$ ,  $m\angle J = 18^\circ$ . (mark the diagram)

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*. (2 stars)



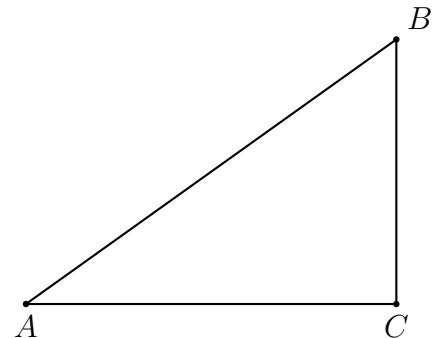
5. Given right  $\triangle ABC$  with  $m\angle C = 90^\circ$ ,  $BC = 5$ ,  $m\angle A = 38^\circ$ . (mark the diagram)

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*. (2 stars)



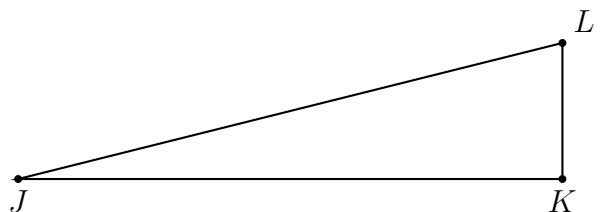
6. Given right  $\triangle ABC$  with  $m\angle C = 90^\circ$ ,  $BC = 11$ ,  $AC = 17$ , and  $m\angle A = x^\circ$ . (mark the diagram)

Write an equation expressing  $\tan x$  as a ratio of *opposite* over *adjacent*. (2 stars)



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*. (2 stars)



**Mastery topic: Algebraic solution**

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

8.  $\tan 75^\circ = \frac{x}{15}$  (2 stars)

9.  $\tan 26^\circ = \frac{4}{x}$  (3 stars)

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

11.  $\tan x^\circ = \frac{17}{9}$  (3 stars)