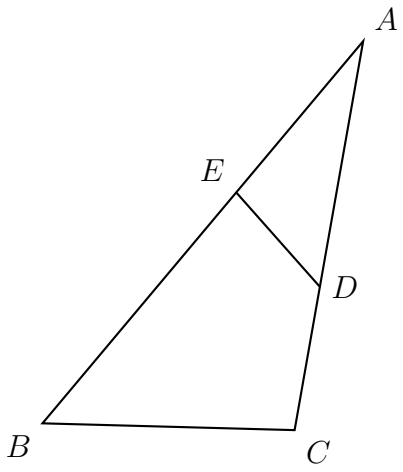
**7.5 Do Now: Similarity transformations and the tangent function**

1. The diagram below shows $\triangle ABC$, with $\overline{AEB}$, $\overline{ADC}$, and $\angle ACB \cong \angle AED$. $AB = 14$, $AD = 8$, and $DE = 4$.




   (a) $\overline{AE} \rightarrow$ _____

   (b) $\overline{AD} \rightarrow$ _____

   (c) $\triangle ADE \sim$ _____

   (d) What is the scale factor?

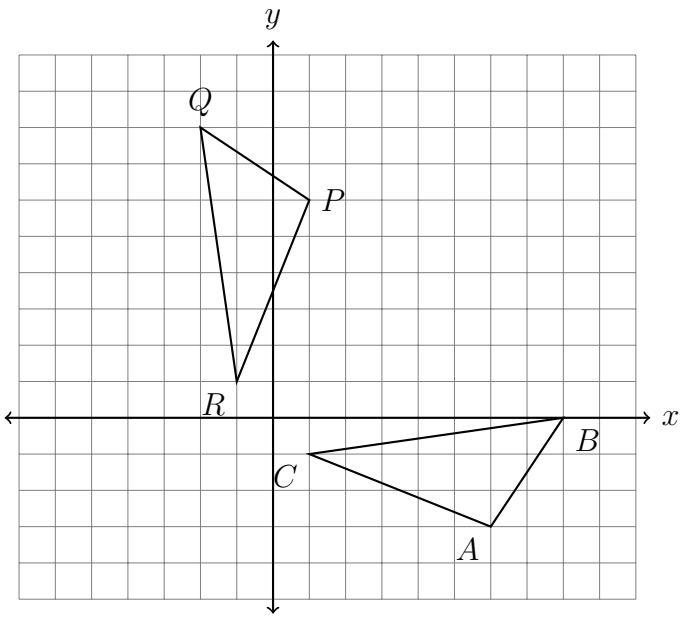
   $k =$ _____

   (e) What is the length of $\overline{BC}$?

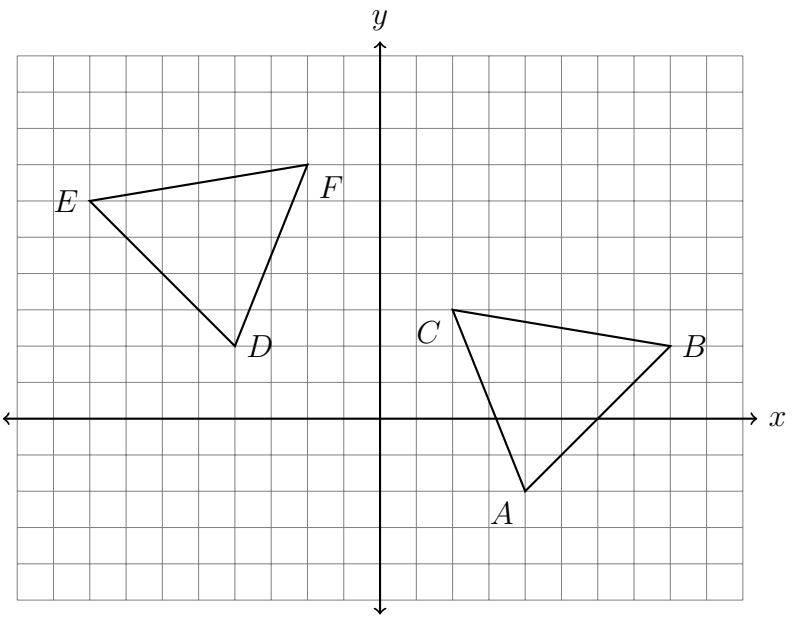
2. Given $\triangle JKL \sim \triangle MNO$. $m\angle J = 43°$ and $m\angle L = 92°$.

   Find the measure of $\angle O$.

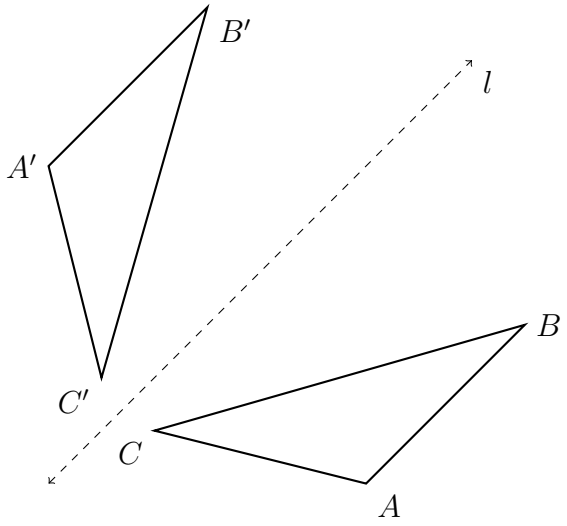
3. Determine and state the transformation or sequence of transformations applied to $\triangle ABC$, mapping it onto $\triangle PQR$, as shown.



4. What series of transformations map $\triangle ABC$ onto $\triangle DEF$, shown below? Fully specify the transformations.



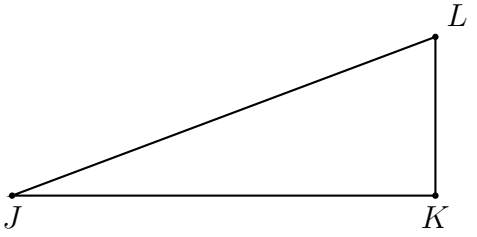

5. The $\triangle ABC$ is reflected across $l$ to yield $\triangle A'B'C'$. $AB = 3x + 4$, $A'B' = 5x - 10$, and $BC = 4x + 12$. Find the length $B'C'$.



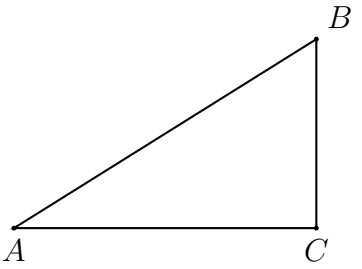
**Modeling: Mark each diagram and write and equation. Do Not Solve!**

6. Given right $\triangle JKL$ with $\overline{JK} \perp \overline{KL}$, $JK = 11$, $m\angle J = 18°$. Let $x$ be the length of the side opposite $\angle J$, $x = KL$.

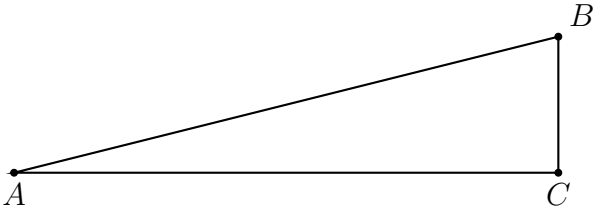
   Write an equation expressing $\tan \angle J$ as a ratio of *opposite* over *adjacent*. (2 stars)



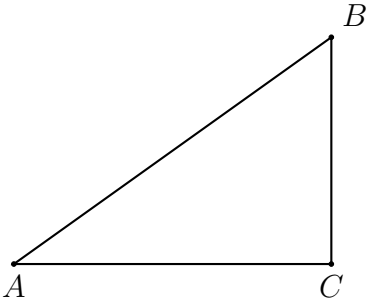

7. Given right $\triangle ABC$ with $m\angle C = 90°$, $BC = 5$, $m\angle A = 38°$. Let $x = AC$. (2 stars)




8. Given right $\triangle ABC$ with $m\angle C = 90°$, $BC = 6$, $AC = 22$, and $m\angle A = x°$. (2 stars)




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



**Mastery topic: Algebraic solution**

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

10. $\tan 75^\circ = \dfrac{x}{15}$

11. $\tan 26^\circ = \dfrac{4}{x}$

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

13. $\cos 35^\circ = \dfrac{x}{10}$

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

14. $x = \tan^{-1}(\dfrac{2}{3.5})$

15. $\tan x^\circ = \dfrac{17}{9}$