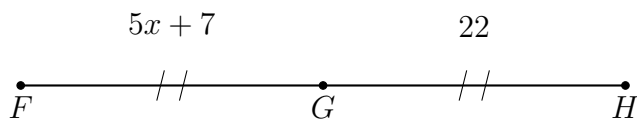


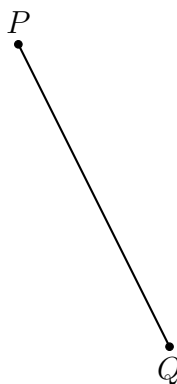
4.14 Exam: Trigonometry and Cumulative Review

1. Point G bisects \overline{FH} , with $FG = 5x + 7$, $GH = 22$. Find x .

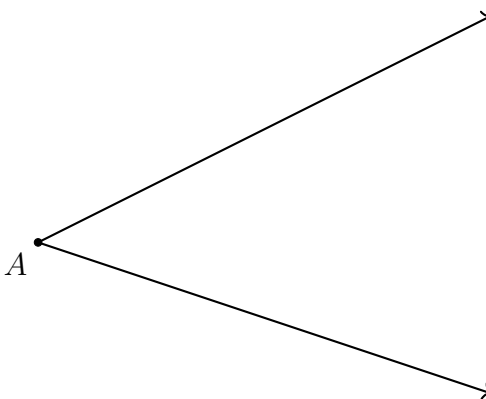


G.CO.12 Make and justify formal geometric constructions

2. Construct a perpendicular bisector of \overline{PQ} .

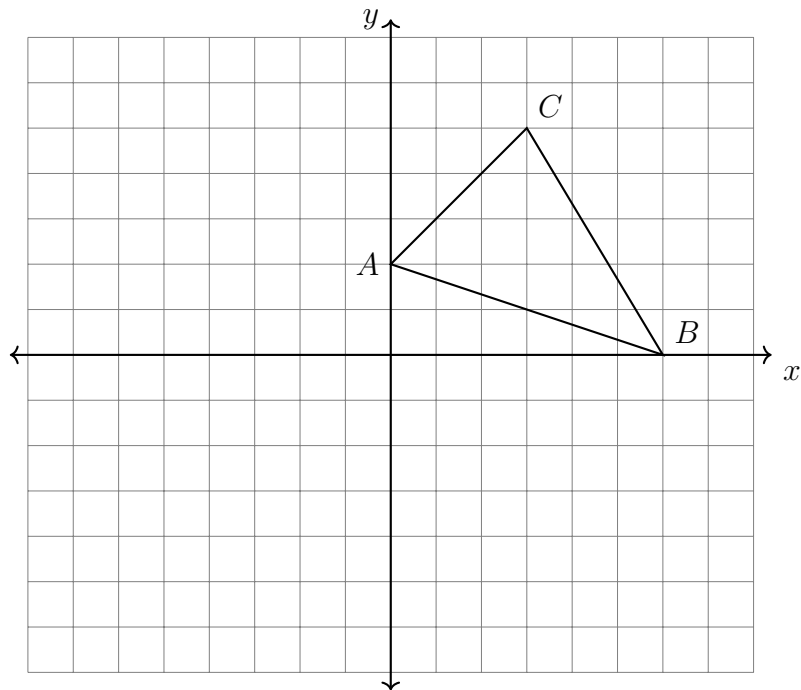


3. Construct the angle bisector of $\angle A$.



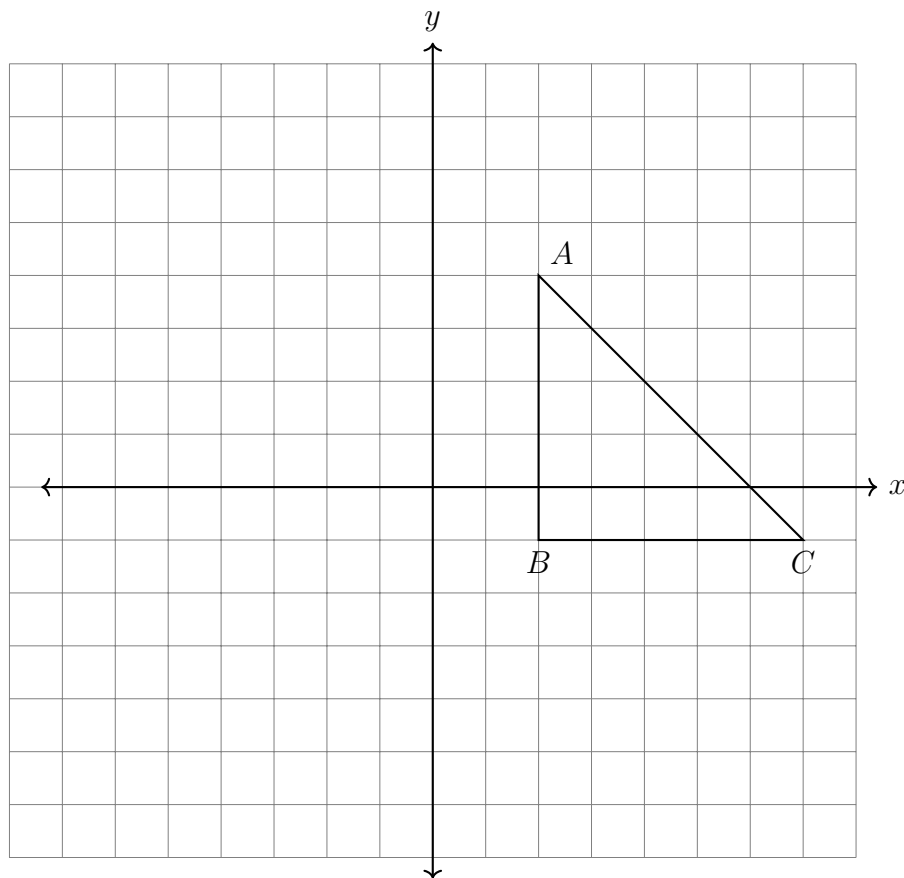
G.CO.5 Transform a figure using translation, reflection, or rotation

4. Reflect $\triangle ABC$ across the x -axis. Label the image $\triangle A'B'C'$ on the graph.

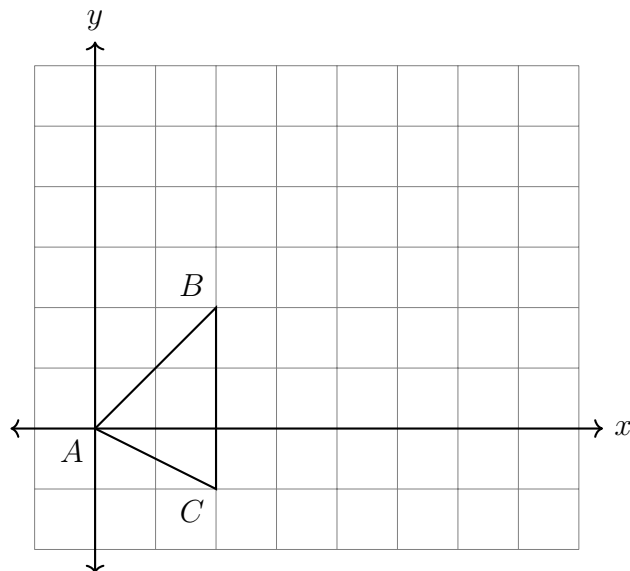


5. A translation maps $P(2, 3) \rightarrow P'(-5, 0)$. What is the image of $Q(6, 2)$ under the same translation?
6. The translation mapping $x \rightarrow x + 4$ and $y \rightarrow y - 5$ is applied to $\triangle ABC$.
- (a) Write as coordinate pairs the vertices of the image, $\triangle A'B'C'$
- $A(-1, 2) \rightarrow$
- $B(3, -2) \rightarrow$
- $C(0, 1) \rightarrow$
- (b) Which triangle is larger, or are they the same size? Justify your answer.

7. Apply a counter clockwise rotation of 90° centered at the origin to $\triangle ABC$. Plot and label the image on the axes below.



8. Dilate $\triangle ABC \rightarrow \triangle A'B'C'$ by a factor of $k = 2$ centered at the origin, $(x, y) \rightarrow (2x, 2y)$. Plot and label the image on the axes.

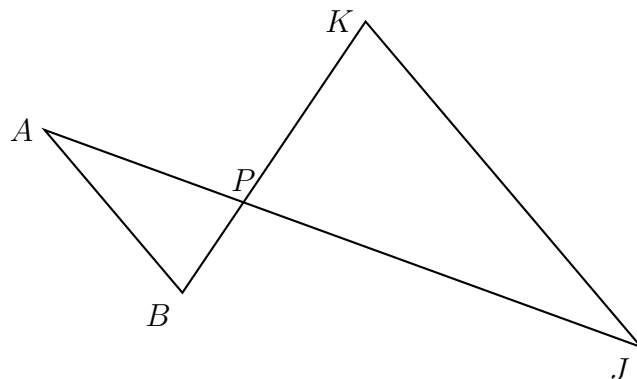


G.SRT.5 Use similarity criteria for triangles to solve problems

9. Given $\triangle ABC \sim \triangle DEF$, $m\angle A = 45^\circ$, and $m\angle F = 110^\circ$. Find $m\angle D$.

10. Two triangles are shown with P the intersection of \overline{AJ} and \overline{BK} .

- (a) What theorem can be used to justify $\angle APB \cong \angle JPK$?



- (b) What angle must be congruent to $\angle J$ to prove $\triangle ABP \sim \triangle JKP$ by *angle-angle similarity*?

11. A dilation maps $\triangle ABC \rightarrow \triangle ADE$. Given $AB = 12$, $AC = 14$, $BC = 10$, $DE = 25$.

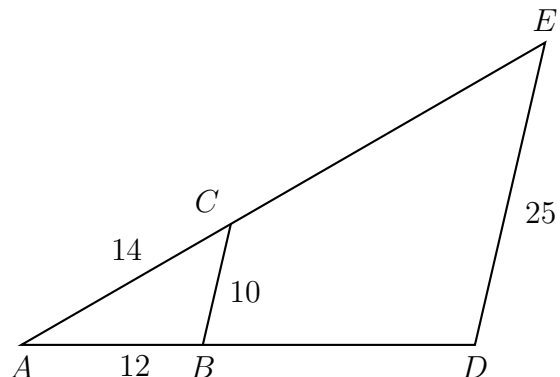
Find the scale factor and side lengths:

$$k =$$

$$AE =$$

$$AD =$$

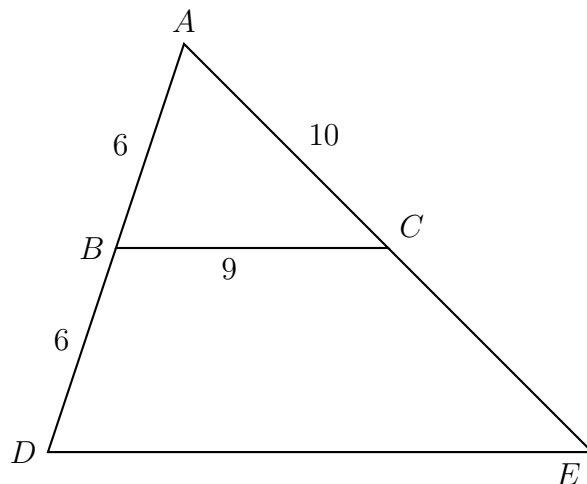
$$BD =$$



12. Triangle ADE is drawn with $\overline{BC} \parallel \overline{DE}$, as shown. Given $AB = 6$, $BC = 9$, $AC = 10$, and $BD = 6$.

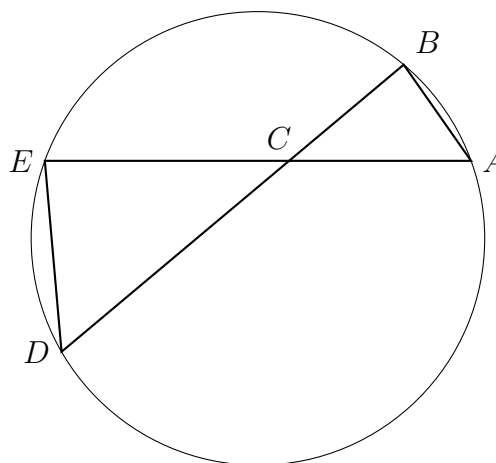
(a) Find DE .

(b) Find AE .



13. In the diagram below, the chords \overline{AE} and \overline{BD} intersect at C , with $\triangle ABC \sim \triangle DEC$.

(a) $m\angle A = 70^\circ$ and $m\angle B = 85^\circ$.
Find $m\angle D$.



(b) $BC = 10$, $CD = 20$, and $CE = 15$.
Find AC .

G.SRT.C.8 Use trigonometry to solve problems with right triangles

14. As shown, right $\triangle ABC$ has $AC = 5$, $BC = 12$, $AB = 13$, $m\angle C = 90^\circ$.

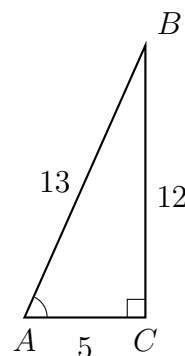
Express each trigonometric ratio as a fraction.

(a) $\sin A =$

(b) $\cos A =$

(c) $\tan A =$

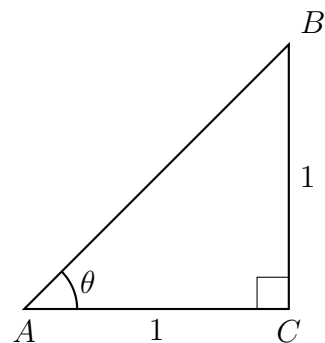
- (d) Find the angle measure of $\angle A$
rounded to the *nearest whole degree*.



15. Isosceles right $\triangle ABC$ is shown with legs $AC = BC = 1$ as marked.

- (a) Write down the value of θ .

- (b) Find the length of hypotenuse AB as
an exact expression.



16. At an angle of elevation of 15° , the top of a structure B is visible from point A on the ground 50 meters away, as shown below.

Find the height h of the structure to the *nearest tenth of a meter*. (not to scale)

