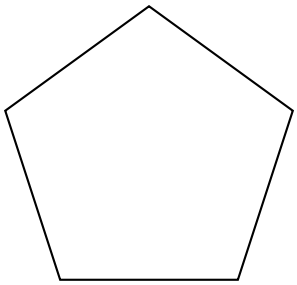
7.7 Classwork: "Onto" mappings, symmetry

1. What is the smallest non-zero angle of rotation about its center that would map the pentagon onto itself?



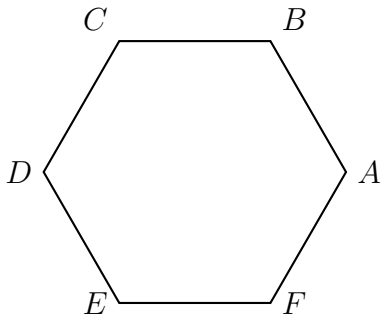
2. Circle YES or NO to indicate whether the given transformation maps the hexagon onto itself.

   (a) Yes No A reflection over $\overleftrightarrow{AD}$

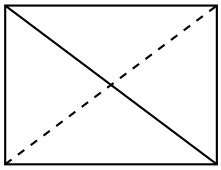
   (b) Yes No A rotation of 60° clockwise around the hexagon's center.

   (c) Yes No A reflection over a line through the midpoints of $\overline{BC}$, $\overline{EF}$.

   (d) Yes No A rotation of 120° counterclockwise around point D.



3. The figure shows a rectangle (not a square).



   Which transformations carries the rectangle onto itself? Mark each True or False.

   (a) A reflection over the solid diagonal True False

   (b) A reflection over the dashed diagonal True False

   (c) A clockwise rotation of 90° about the intersection of the diagonals True False

   (d) A clockwise rotation of 180° about the intersection of the diagonals True False

4. A transformation maps $\triangle ABC \to \triangle DEC$, shown below.

   (a) Fully specify the transformation.

   (b) Identify each corresponding object.

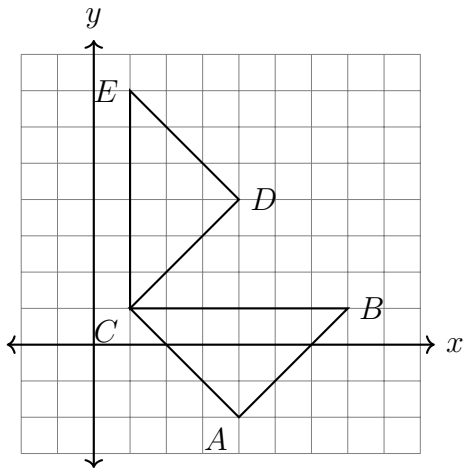
   i. $A \to$ _____

   ii. $B \to$ _____

   iii. $C \to$ _____

   iv. $\angle ACB \cong$ _____

   v. _____ $\cong \overline{DE}$



5. Check those transformations that are rigid motions.

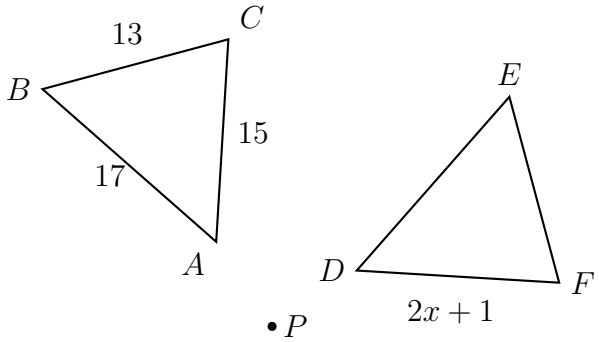
   ☐ Dilation
   ☐ Rotation
   ☐ Translation
   ☐ An isometry
   ☐ Reflection
   ☐ Horizontal stretch

6. In the diagram below, $\triangle ABC$ with sides of 13, 15, and 17, is mapped onto $\triangle DEF$ after a clockwise rotation of 90° about point P.

   (a) What is A mapped to? $A \to$

   (b) What corresponds to F?

   (c) Given $DF = 2x + 1$. Find x.



7. Reflect $\triangle TRS$ across the y-axis, labeling the image $\triangle T'R'S'$. Check those properties that are maintained by reflection.

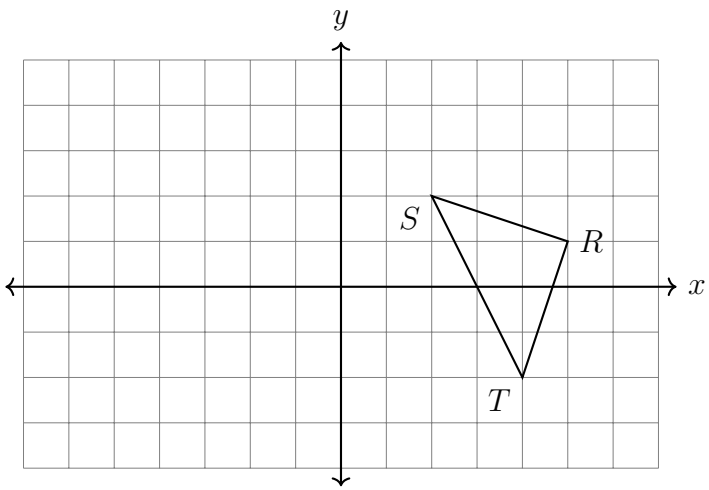
☐ Length

☐ Angle measures

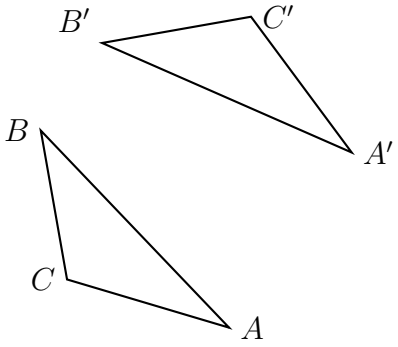
☐ Orientation

☐ Parallel relationships

☐ Area

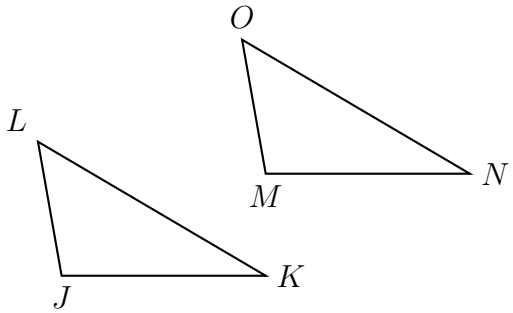


8. Draw the line of reflection that would map $\triangle ABC$ onto $\triangle A'B'C'$.

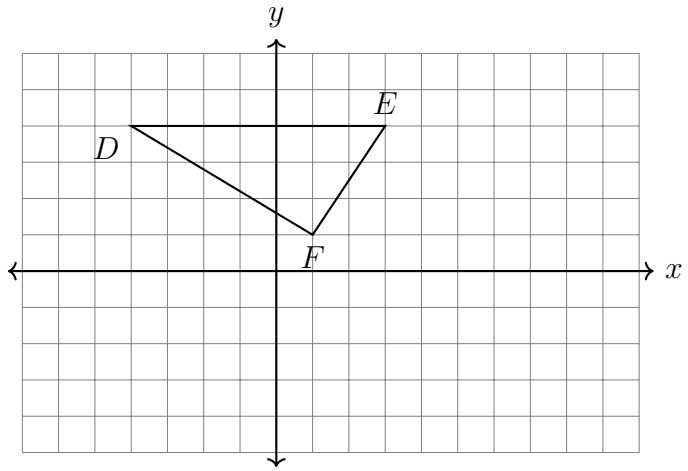


9. An isometry maps $\triangle JKL \to \triangle MNO$. $m\angle K = 40°$ and $m\angle M = 100°$.

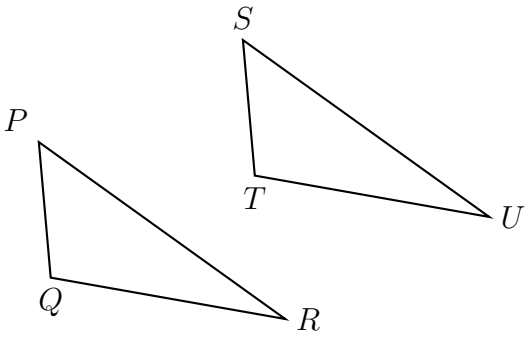
   Find the measure of $\angle L$.



10. Translate $\triangle DEF$ by $(x, y) \to (x + 3, y - 5)$. Label the image $\triangle D'E'F'$.



11. A translation maps triangle PQR onto triangle STU.



Write each corresponding object.

(a) $Q \to$ _____

(b) $\angle QRP \cong$ _____

(c) _____ $\cong \overline{ST}$

(d) Justify $\triangle PQR \cong \triangle STU$. Use the words "rigid motion".

12. Translate $\triangle XYZ$ with $X(-1, 2)$, $Y(3, 4)$, $Z(1, -3)$ by $(x, y) \to (x - 6, y - 1)$, labeling the image $\triangle X'Y'Z'$.