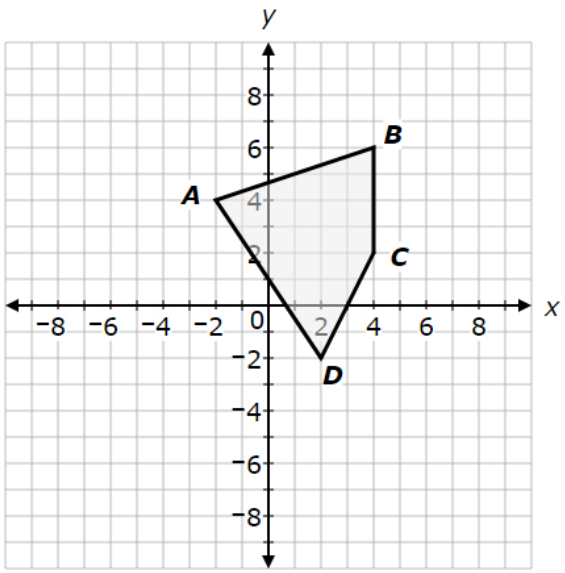
A rectangle is dilated on the coordinate plane. The area of the dilated rectangle is 16 times the area of the original rectangle. What is the scale factor of the dilation?

Quadrilateral *ABCD* is shown on the coordinate grid. The quadrilateral is dilated by a factor of 1.5 about the origin to create *A′B′C′D′*. Use the grid to create *A′B′C′D′*.



There are two rectangles.

- Rectangle *WXYZ* has a length of 12.5 inches and a width of 6.25 inches.
- For rectangle *RSTU*, the length is twice its width.

Which statement will **always** be true of the relationship between rectangle *WXYZ* and rectangle *RSTU*?

Ⓐ Rectangle *WXYZ* and rectangle *RSTU* are similar.

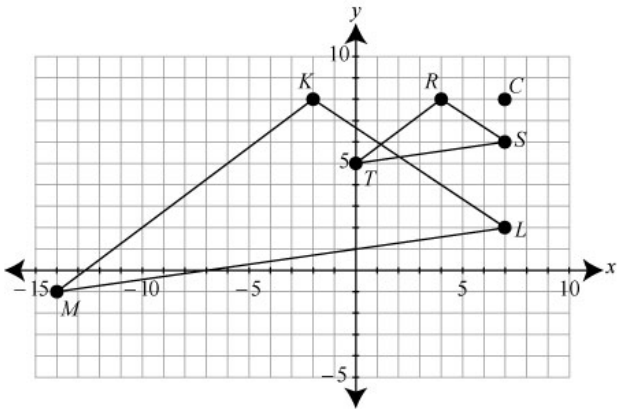
Ⓑ The area of rectangle *RSTU* is twice the area of rectangle *WXYZ*.

Ⓒ The areas of rectangle *WXYZ* and rectangle *RSTU* are the same.

Ⓓ Rectangle *WXYZ* and rectangle *RSTU* are congruent.

At a certain time of day, a tree has a shadow 50 feet long. At the same time, a 6-foot-tall man stands next to the tree, and his shadow is 20 feet long. What is the height of the tree, in feet?

Triangle *RST* is a dilation of triangle *KLM* with the center of dilation at point *C*, as shown.



What is the scale factor of this dilation?

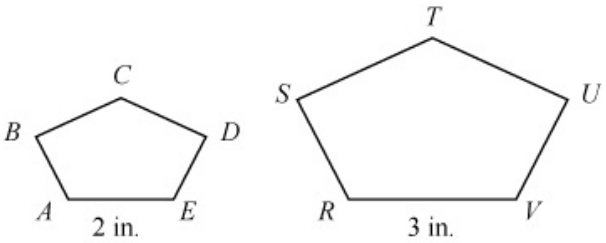
Ⓐ $\frac{1}{6}$

Ⓑ $\frac{1}{4}$

Ⓒ $\frac{1}{3}$

Ⓓ $\frac{3}{7}$

Pentagon *ABCDE* is similar to pentagon *RSTUV*.



Which must be true of the measure of angle *A*?

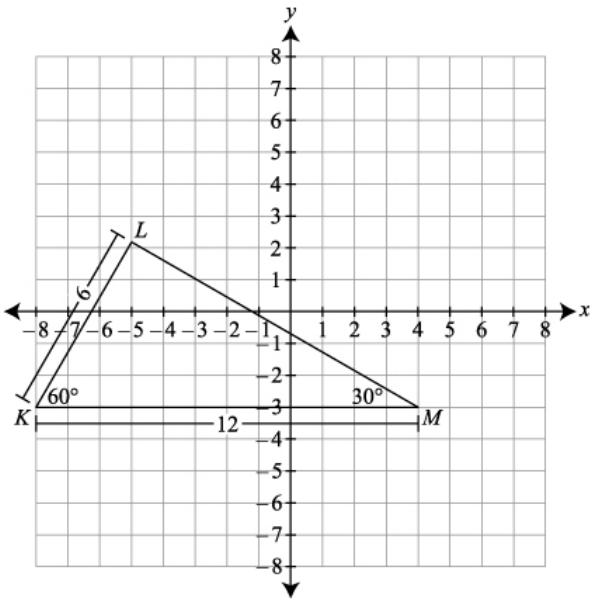
Ⓐ It is $\frac{2}{3}$ the measure of angle *V*.

Ⓑ It is congruent to the measure of angle *E*.

Ⓒ It is congruent to the measure of angle *R*.

Ⓓ It is smaller than any angle found in *RSTUV*.

Triangle *KLM* is shown.



Triangle *KLM* is dilated by a factor of $\frac{2}{3}$ and translated 2 units to the right. Which statement about the image $\Delta K'L'M'$ is true?

Ⓐ $K'L'$ = 6 units

Ⓑ $K'M'$ = 14 units

Ⓒ m$\angle M'$ = 30°

Ⓓ m$\angle K'$ = 40°

Which statement would prove there is a similarity transformation between two triangles?

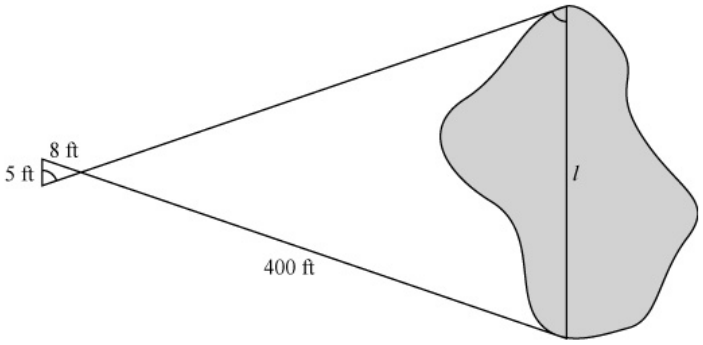
Ⓐ If two sides of one triangle are congruent to two sides of another triangle, then the triangles are similar.

Ⓑ If two sides of one triangle are proportional to two sides of another triangle, then the triangles are similar.

Ⓒ If two angles of one triangle are congruent to two angles of another triangle, the two triangles are similar.

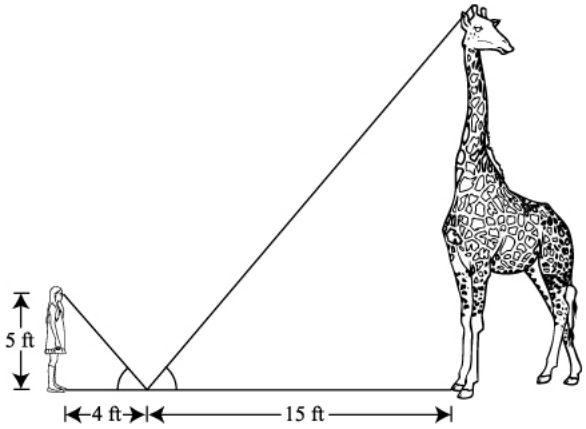
Ⓓ If two angles of one triangle are proportional to two angles of another triangle, then the triangles are similar.

Mr. Smith wants to find the length, *l*, of a pond. He knows the distances shown in the diagram.



What is the length, in feet, of the pond?

Ramona wants to find the height of the giraffe statue outside the library. She places a mirror on the ground and walks backward until she can see the giraffe's head in the mirror. She knows the measurements shown in the picture.



About how tall is the statue?

Ⓐ 12 ft

Ⓑ 16 ft

Ⓒ 19 ft

Ⓓ 24 ft

A point $P(7, 4)$ is translated 3 units down and 1 unit right. The image P' of P is then rotated 180° clockwise around the origin, resulting in point P''. What are the coordinates of P''?

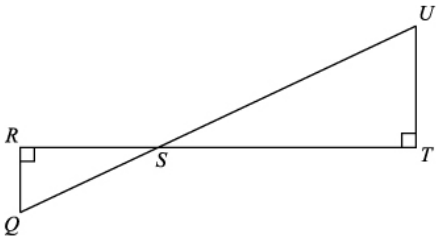
Ⓐ $(-8, -1)$

Ⓑ $(-4, -5)$

Ⓒ $(1, -8)$

Ⓓ $(5, -4)$

The two triangles shown are similar.



Which angle has the same measure as $\angle RQS$?

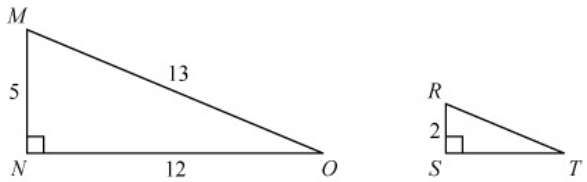
Ⓐ $\angle QRS$

Ⓑ $\angle UST$

Ⓒ $\angle UTS$

Ⓓ $\angle TUS$

If triangle *MNO* is similar to triangle *RST*, what is the perimeter of triangle *RST*?



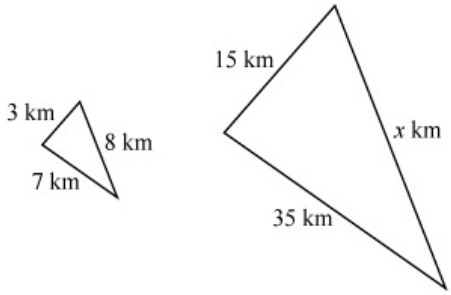
Ⓐ 4.8

Ⓑ 5.2

Ⓒ 10

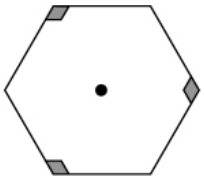
Ⓓ 12

The diagram shows the side lengths of two similar triangles.



What is the value of *x*, in kilometers?

A regular hexagon with three congruent rhombus-shaped sections is shown in the figure.



What is the **smallest** rotation clockwise about the center of the figure that will carry the entire figure onto itself?

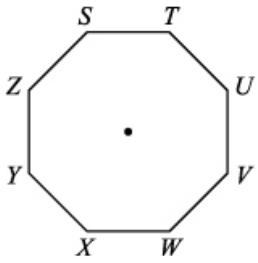
Ⓐ 60°

Ⓑ 90°

Ⓒ 120°

Ⓓ 180°

Regular octagon *STUVWXYZ* is rotated 135 degrees clockwise around its center.



Vertex *X* is carried onto which vertex after the rotation?

Ⓐ *S*

Ⓑ *U*

Ⓒ *W*

Ⓓ *Z*

Point *P* has image *P'*, where *P* and *P'* are the endpoints of an arc of *N* degrees along a circle centered at *O* with radius *OP*. Which transformation is described?

Ⓐ reflection over *OP*

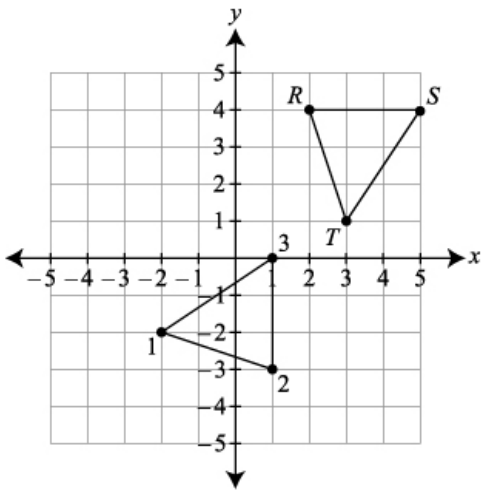
Ⓑ translation along vector *OP*

Ⓒ rotation of *N* degrees centered at *O*

Ⓓ dilation with a scale factor of *N* centered at *O*

Triangle *RST* is translated 5 units left and 3 units down, then reflected over the line [ ] .

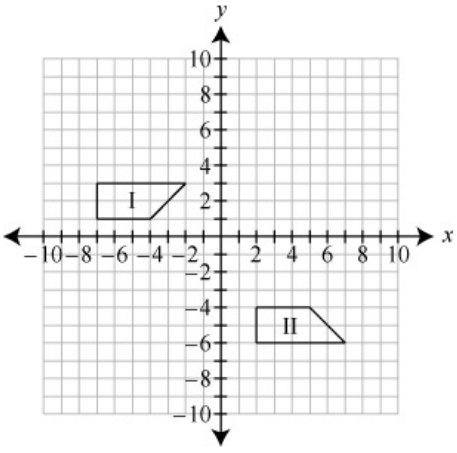
- y = 1
- y = x
- y = −x



Angle 1 is congruent to angle [ ] .

- R
- S
- T

Which transformations applied to polygon I would produce polygon II?



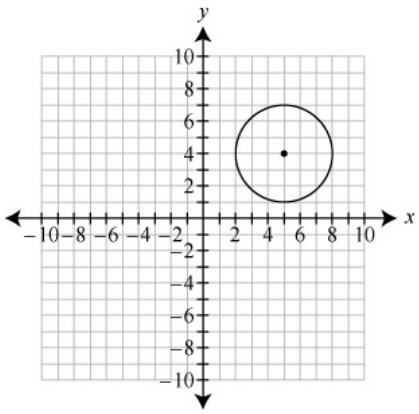
Ⓐ Translate 9 units right and 7 units down.

Ⓑ Reflect across the *y*-axis and translate 7 units down.

Ⓒ Reflect across the *x*-axis and translate 9 units right and 3 units down.

Ⓓ Reflect across the *x*-axis, reflect across the *y*-axis, and translate 3 units down.

The circle shown has its center located at the point (5, 4).



The circle is reflected over the line $y = -x$. What are the coordinates of the center of the image?

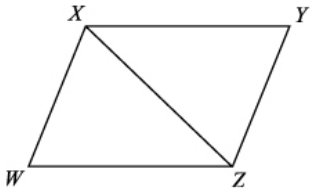
Ⓐ (−5, 4)

Ⓑ (− 4, −5)

Ⓒ (4, 5)

Ⓓ (5, − 4)

Parallelogram *WXYZ* is shown, including diagonal $\overline{XZ}$.



Which single, rigid motion could be applied to $\triangle WXZ$ in order to show that $\triangle WXZ \cong \triangle YZX$?

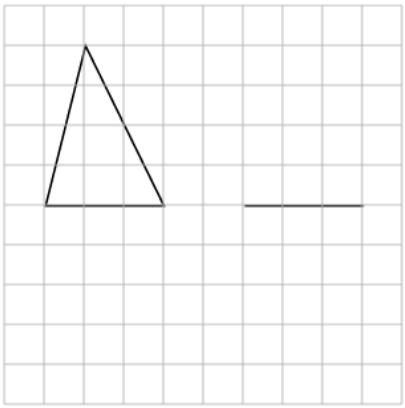
Ⓐ reflection across $\overline{WZ}$

Ⓑ reflection across $\overline{XZ}$

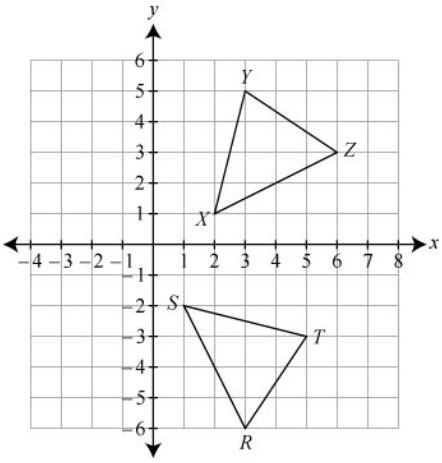
Ⓒ rotation about the midpoint of $\overline{WZ}$

Ⓓ rotation about the midpoint of $\overline{XZ}$

A triangle and a segment are shown. Use the grid to add all points which, when connected to the endpoints of the segment, form a second triangle that is congruent to the first triangle.



Two congruent triangles are shown on the coordinate plane.



Which congruency statement is true?

(A) $\overline{XZ} \cong \overline{ST}$

(B) $\overline{XZ} \cong \overline{TR}$

(C) $\overline{YZ} \cong \overline{ST}$

(D) $\overline{YZ} \cong \overline{TR}$

If $\triangle XYZ$ is reflected over the x-axis, its image is $\triangle X'Y'Z'$. If $m\angle X = 50°$, $m\angle Y = 70°$, then $m\angle Z' = ?$

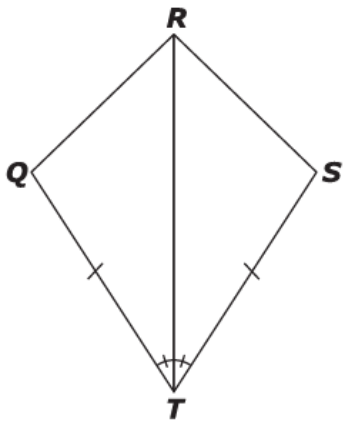
Ⓐ 50°

Ⓑ 60°

Ⓒ 70°

Ⓓ 120°

For the figure shown below, $TQ \cong TS$ and $\angle QTR \cong \angle STR$.



Which transformation of $\triangle RTS$ is implied to create $\triangle RTQ$, proving $\triangle RTS \cong \triangle RTQ$?

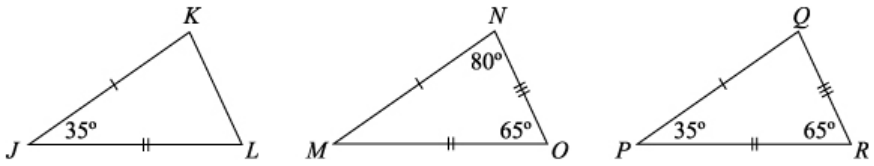
Ⓐ a reflection of $\triangle RTS$ over segment TR

Ⓑ a rotation of $\triangle RTS$ counterclockwise about T, with an angle measure of 2 times the measure of angle STR

Ⓒ a horizontal translation of $\triangle RTS$ by the distance from S to T

Ⓓ insufficient information given to prove any transformation of $\triangle RTS$ has image $\triangle RTQ$

Three triangles are shown.



Select **all** statements that must be true.

A There is a rigid motion that maps $\triangle JKL$ to $\triangle MNO$.

B There is no rigid motion that maps $\triangle JKL$ to $\triangle PQR$.

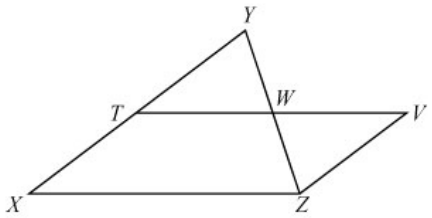
C $\triangle JKL$ and $\triangle PQR$ can be proved to be congruent.

D $\angle MNO$ can be proved to be congruent to $\angle PQR$.

E $\angle JLK$ has measure 55°.

An incomplete proof is shown.

Given: W is the midpoint of $\overline{YZ}$, W is on $\overline{TV}$, and $\overline{TW} \cong \overline{WV}$.



Prove: $\overline{TY} \cong \overline{VZ}$

Statement	Reason
1. W is the midpoint of $\overline{YZ}$.	1. Given
2. $\overline{WY} \cong \overline{WZ}$	2. Definition of a midpoint
3. $\angle TWY \cong \angle VWZ$	3. Vertical angles theorem
4. $\overline{TW} \cong \overline{WV}$	4. Given
5. $\triangle TWY \cong \triangle VWZ$	5. _____?_____
6. $\overline{TY} \cong \overline{VZ}$	6. Corresponding parts of congruent triangles are congruent.

What is the reason that justifies Statement 5?

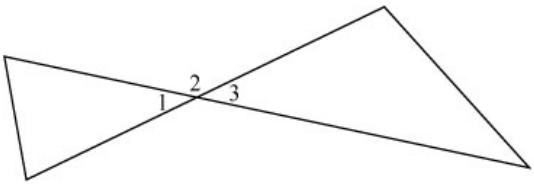
A side-side-side

B side-angle-side

C angle-angle-side

D angle-side-angle

The following drawing and statements are used in a proof.



Statement
1. $m\angle 1 + m\angle 2 = 180°$ $m\angle 2 + m\angle 3 = 180°$
2. $m\angle 1 + m\angle 2 = m\angle 2 + m\angle 3$
3. $m\angle 1 = m\angle 3$

The statements above can be used in the order given to prove what geometric theorem?

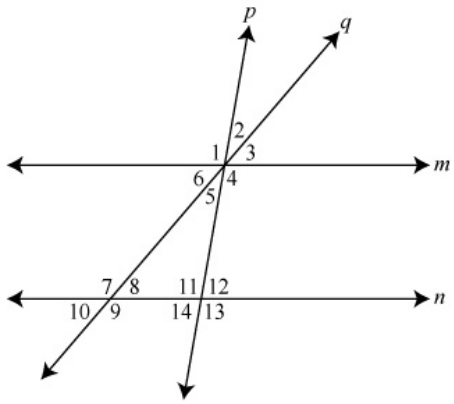
Ⓐ Vertical angles are congruent.

Ⓑ Supplementary angles are congruent.

Ⓒ Two angles that form a linear pair are supplementary.

Ⓓ The sum of the measures of the angles of a triangle is 180°.

The figure shows parallel lines m and n cut by transversals p and q.



Connect the equal values.

$m\angle 5$

$m\angle 1$

$m\angle 13$

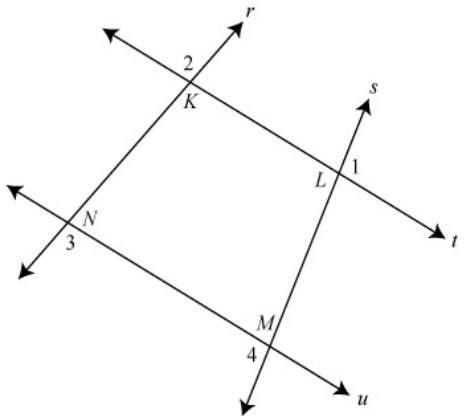
$m\angle 2$

$m\angle 4 + m\angle 5$

$m\angle 7$

$180° - m\angle 12$

In this diagram, $m\angle 1 = m\angle 2 = m\angle 3 = m\angle 4$ and $KL = \frac{-}{3}(MN)$.



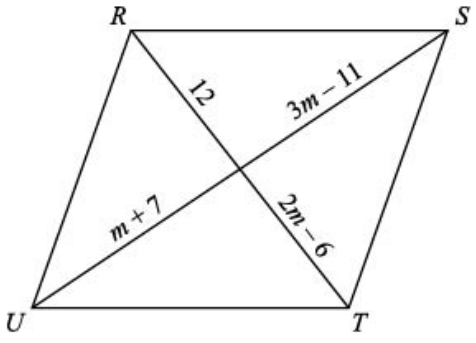
Using [ ] $\overleftrightarrow{KL}$ can be proved to be parallel to $\overleftrightarrow{NM}$. Quadrilateral *KLMN* is a [ ]

- vertical angles
- alternate exterior angles
- opposite exterior angles

a [ ]

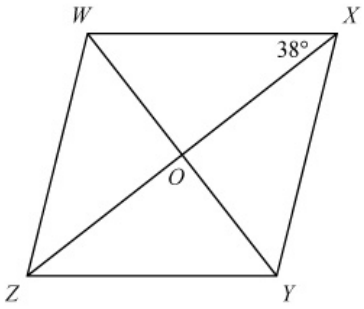
- rectangle
- parallelogram that is not a rectangle
- trapezoid with exactly one pair of parallel sides

Figure *RSTU* is a parallelogram.



What is the length of $\overline{US}$, in units?

The rhombus $WXYZ$ has diagonals that meet at point O.



What is the measure of $\angle XWO$?

Ⓐ 38°

Ⓑ 52°

Ⓒ 90°

Ⓓ 142°

Given a point R, there exists a set of points in the same plane such that each point is the same distance from R. This set of points defines what figure?

Ⓐ circle

Ⓑ ellipse

Ⓒ parabola

Ⓓ square

What figure is defined as the set of all the points in a plane that are the same distance from a given point on the same plane?

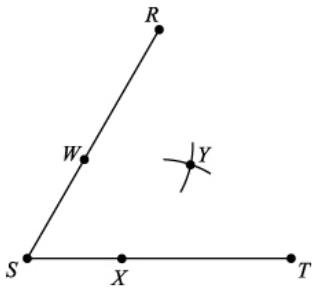
Ⓐ a circle

Ⓑ a square

Ⓒ a line parallel to a given line

Ⓓ the perpendicular bisector of a segment

Henry is bisecting $\angle RST$ and has created points *W*, *X*, and *Y* so that $\overline{SW} \cong \overline{SX}$ and $\overline{WY} \cong \overline{XY}$.



Which two points are on the ray that bisects $\angle RST$?

Ⓐ *S* and *Y*

Ⓑ *R* and *T*

Ⓒ *W* and *X*

Ⓓ *X* and *Y*

The transformation $(x', y') = (x + 2, y - 3)$ is applied to figure *PQRS*.

Use the grid to create P'Q'R'S.