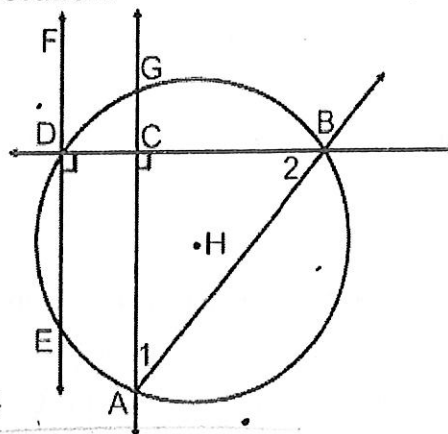


Write the correct vocabulary word next to the definition.

- Point - an exact position or location in a given plane
- Line segment - part of a line bounded by two distinct endpoints
- Angle - formed where two lines or rays share an endpoint
- Parallel lines - two coplanar lines that have unique points and never cross
- Ray - a portion of a line that starts at a point and continues to infinity
- Perpendicular lines - creates four right angles
- Complementary Angles - two angles whose sum is 90 degrees.

Find each geometry term in the diagram. Label using correct notation. *answers may vary

- Ray: \overrightarrow{AB}
- Circle: $\odot H$
- Line: \overleftrightarrow{DB}
- Line Segment: \overline{CB}
- $\angle 1$: $\angle CAB$
- $\angle 2$: $\angle CBA$



Solve for x and find the measures of both angles.

14. $\angle 1$ and $\angle 2$ are supplementary. $\angle 1 = 8x - 14$ and $\angle 2 = 2x + 54$

$$\begin{aligned} \angle 1 + \angle 2 &= 180 \\ 8x - 14 + 2x + 54 &= 180 \\ 10x + 40 &= 180 \\ 10x &= 140 \\ x &= 14 \end{aligned}$$

$$\begin{aligned} \angle 1 &= 8(14) - 14 = 98^\circ \\ \angle 2 &= 2(14) + 54 = 82^\circ \end{aligned}$$

15. $\angle 3$ and $\angle 4$ are congruent. $\angle 3 = 12x - 22$ and $\angle 4 = 8x + 42$

$$\begin{aligned} \angle 3 &= \angle 4 \\ 12x - 22 &= 8x + 42 \\ 4x - 22 &= 42 \\ 4x &= 64 \\ x &= 16 \end{aligned}$$

$$\begin{aligned} \angle 3 &= 12(16) - 22 = 170^\circ \\ \angle 4 &= 8(16) + 42 = 170^\circ \end{aligned}$$

16. Use the translation $(x, y) \rightarrow (x + 1, y - 7)$ for questions a - d.

a. What is the translation vector? $\langle 1, -7 \rangle$

b. What is the image of A (10, -4)? $A'(11, -11)$

c. What is the image of A' from part b (which would be called A'')? $A''(12, -18)$

d. What is the pre-image of C' (-9, 12)? $C(-10, 19)$

17. What is an isometry? A transformation that preserves congruence, (same shape and same size)

18. The vertices of $\triangle ABC$ are $A(-1, 0)$, $B(5, 3)$, and $C(2, -4)$. Find the vertices of $\triangle A'B'C'$ given the transformation rules below. Then describe the transformation that occurred.

a. $(x, y) \rightarrow (x + 11, y - 5)$ $A' = (10, -5)$, $B' = (16, -2)$, $C' = (13, -9)$

Transformation: Translation $\langle 11, -5 \rangle$

b. $(x, y) \rightarrow (-x, -y)$ $A' = (1, 0)$, $B' = (-5, -3)$, $C' = (-2, 4)$

Transformation: Rotation 180°

c. $(x, y) \rightarrow (y, -x)$ $A' = (0, 1)$, $B' = (3, -5)$, $C' = (-4, -2)$

Transformation: Rotation 90° cw

d. $(x, y) \rightarrow (4x, 4y)$ $A' = (-4, 0)$, $B' = (20, 12)$, $C' = (8, -16)$

Transformation: Dilation by a scale factor of 4

e. $(x, y) \rightarrow (y, x)$ $A' = (0, -1)$, $B' = (3, 5)$, $C' = (-4, 2)$

Transformation: Reflection over $y = x$

f. $(x, y) \rightarrow (-y, x)$ $A' = (0, -1)$, $B' = (-3, 5)$, $C' = (4, 2)$

Transformation: Rotation 90° ccw

19. Answer the following questions.

a. After a reflection over the line $y = x$, $(-2, 16)$ is the image of point C. What is the original location of point C?

$(x, y) \rightarrow (y, x)$

$C(16, -2)$

b. After a reflection over the x-axis, $(8, 0)$ is the image of point M. What is the original location of point M?

$(x, y) \rightarrow (x, -y)$

$M(8, 0)$

* Point does not change because it is on the x-axis (line of reflection).

c. Given triangle FUN with coordinates $F(-4, 1)$, $U(11, -12)$ and $N(-7, -9)$, find the image of point N after a rotation of 90 degrees counterclockwise.

$(x, y) \rightarrow (-y, x)$

$N'(9, -7)$

d. After a dilation with a scale factor of $\frac{1}{2}$, $(5, -4)$ is the **image** of point N. What is the original location of point N?

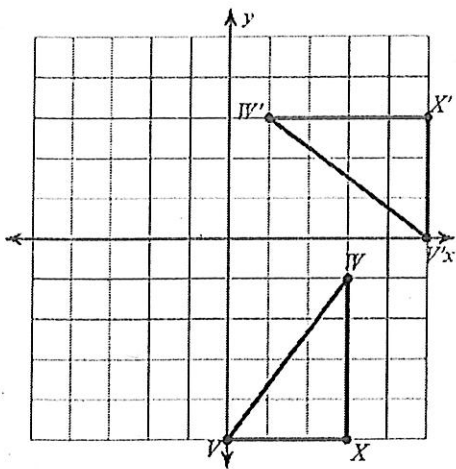
\rightarrow new image

* Multiply by 2 to get original image.

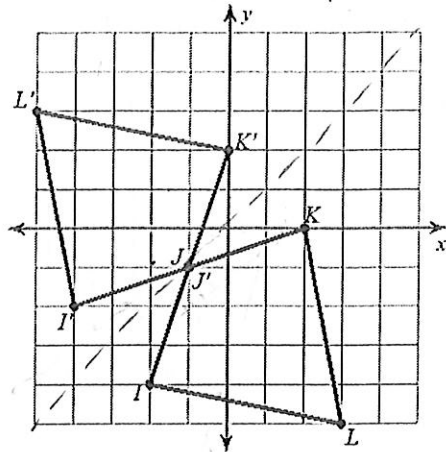
$N(10, -8)$

20. Write the transformation rule for the following graphs.

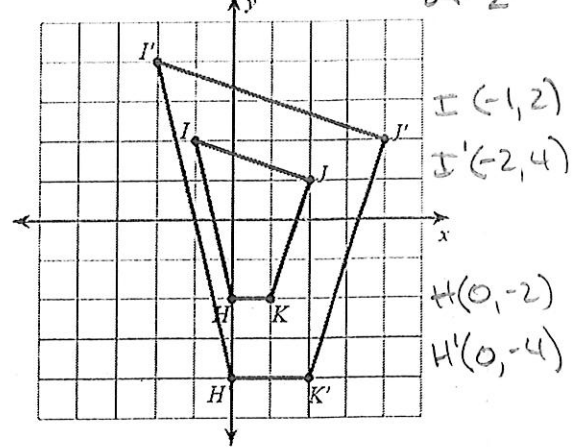
a. Rotation 90° CCW



b. Reflection $y=x$

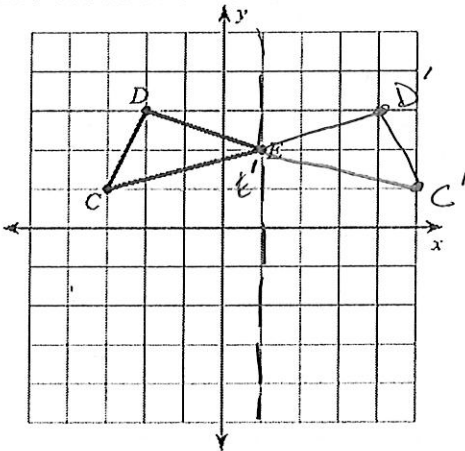


c. Dilation with a scale factor of 2

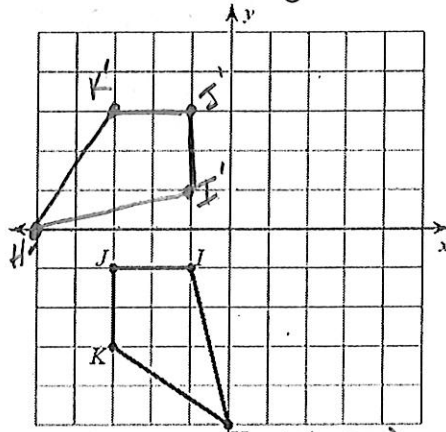


Follow the instructions for each graph.

21. Reflection over $x=1$

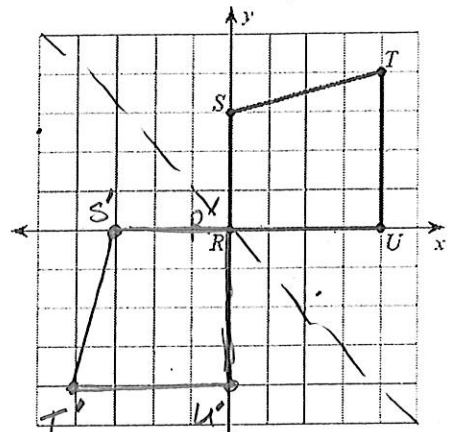


22. Rotation 90 degrees CW
 $(x, y) \rightarrow (y, -x)$



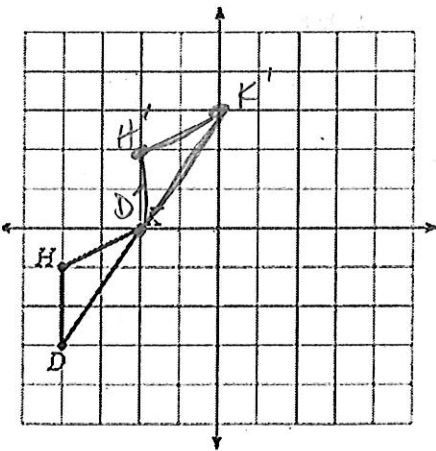
$H(0, -5)$ $H'(-5, 0)$
 $I(-1, -1)$ $I'(-1, 1)$
 $J(-3, -1)$ $J'(-1, 3)$
 $K(-3, -3)$ $K'(-3, 3)$

23. Reflection over $y=-x$
 $(x, y) \rightarrow (-y, -x)$

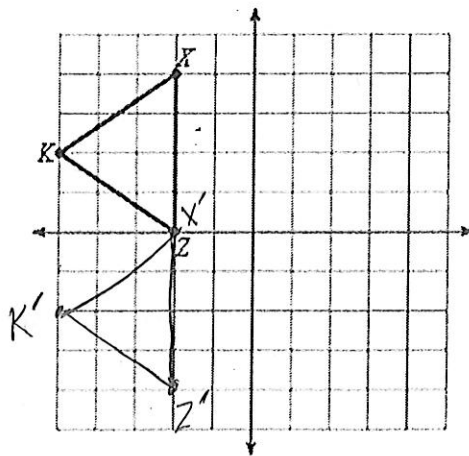


$S(0, 3)$ $S'(-3, 0)$
 $T(4, 4)$ $T'(-4, -4)$
 $U(4, 0)$ $U'(0, -4)$

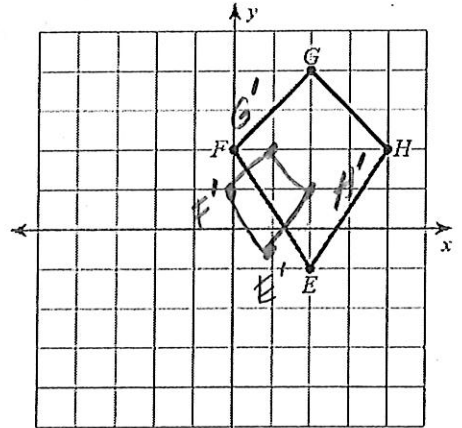
24. $\langle 2, 3 \rangle$



25. $(x, y) \rightarrow (x, y - 4)$



26. $(x, y) \rightarrow (0.5x, 0.5y)$

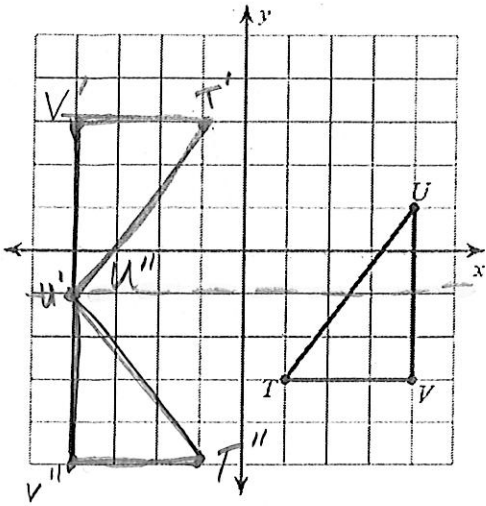


$E(2, -1)$ $E'(1, -.5)$
 $F(0, 2)$ $F'(0, 1)$
 $G(2, 4)$ $G'(1, 2)$
 $H(4, 2)$ $H'(2, 1)$

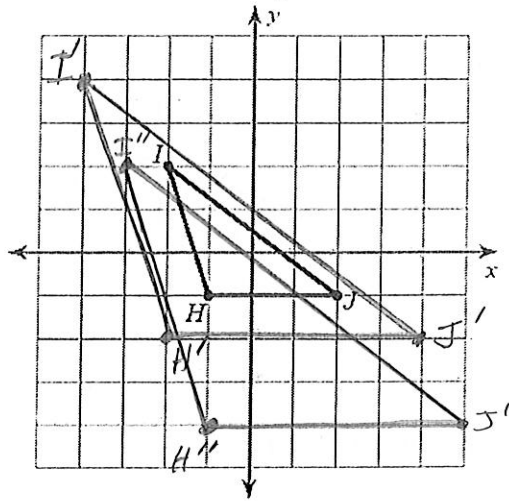
Composition of Transformations

(Label the first transformation with $\Delta A'B'C'$. After the second transformation, label it with $\Delta A''B''C''$.)

27. a. rotation 180 degrees $(x, y) \rightarrow (-x, -y)$
 b. reflection over $y = -1$
28. a. dilation of 2
 b. $\langle 1, -2 \rangle$ right 1, down 2



$V' (-4, 3)$	$V'' (-4, -5)$
$U' (-4, -1)$	$U'' (-4, -1)$
$T' (-1, 3)$	$T'' (-1, -5)$



$H (-1, -1)$
 $I (-2, 2)$
 $J (2, -1)$

$H' (-2, -2)$	$H'' (-1, -4)$
$I' (-4, 4)$	$I'' (-3, 2)$
$J' (4, -2)$	$J'' (5, -4)$

GOOD LUCK STUDYING!!!! Don't forget to study your notes, your quiz, and this test review!!!