Unit 1 Test Study Guide
(Transformations) and Transversals

Name: _____

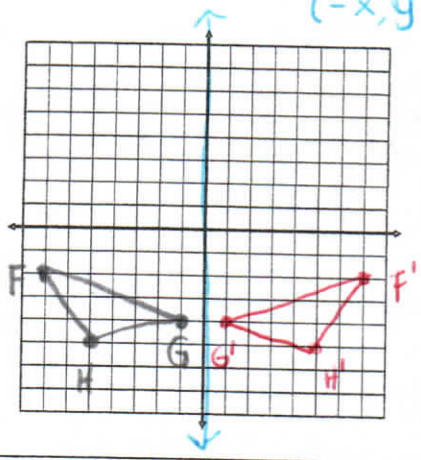
Date: _____ Block: _____

Topic 1: Reflections

Directions: Graph and label each figure and its image under the given reflection.

1. Triangle FGH with vertices $F(-7, -2)$, $G(-1, -4)$ and $H(-5, -5)$: in the y-axis

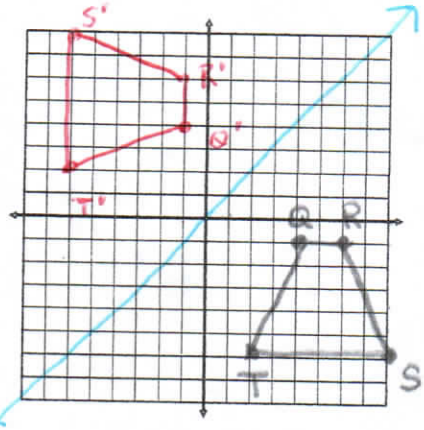
(-x, y)



F' (7, -2)
G' (1, -4)
H' (5, -5)

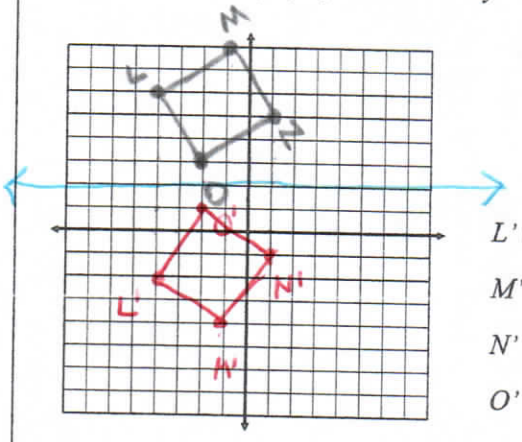
2. Trapezoid $QRST$ with vertices $Q(4, -1)$, $R(6, -1)$, $S(8, -6)$ and $T(2, -6)$: in the line $y = x$

(y, x)



Q' (-1, 4)
R' (-1, 6)
S' (-6, 8)
T' (-6, 2)

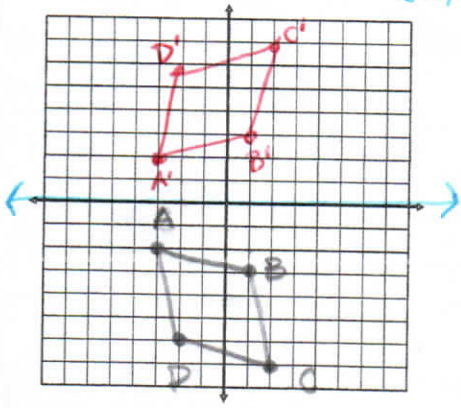
3. Square $LMNO$ with vertices $L(-4, 6)$, $M(-1, 8)$, $N(1, 5)$, and $O(-2, 3)$: in the line $y = 2$



L' (-4, -2)
M' (-1, -4)
N' (1, -1)
O' (-2, 1)

4. Rhombus $ABCD$ with vertices $A(-3, -2)$, $B(1, -3)$, $C(2, -7)$ and $D(-2, -6)$: in the x-axis

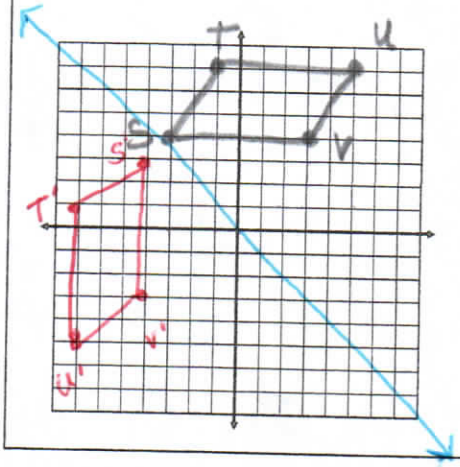
(x, -y)



A' (-3, 2)
B' (1, 3)
C' (2, 7)
D' (-2, 6)

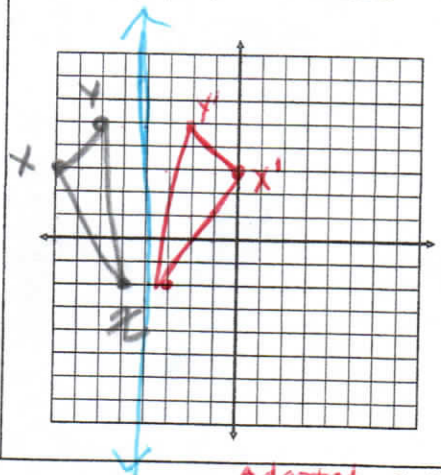
5. Parallelogram $STUV$ with vertices $S(-3, 4)$, $T(-1, 7)$, $U(5, 7)$, and $V(3, 4)$: in the line $y = -x$

(-y, -x)



S' (-4, 3)
T' (-7, 1)
U' (-7, -5)
V' (-4, -3)

6. Triangle XYZ with vertices $X(-8, 3)$, $Y(-6, 5)$, and $Z(-5, -2)$: in the line $x = -4$



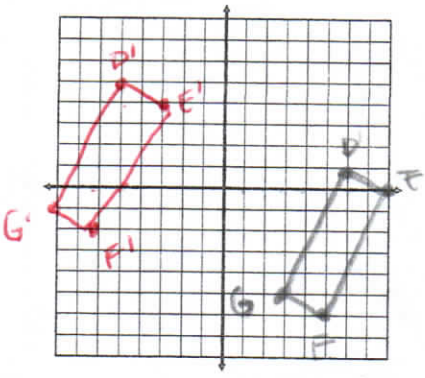
X' (0, 3)
Y' (-2, 5)
Z' (-3, -2)

Adapted

Topic 2: Translations

Directions: Graph and label each figure and its image under the given translation.

7. Rectangle $DEFG$ with vertices $D(6, 1)$, $E(8, 0)$, $F(5, -6)$, and $G(3, -5)$: $(x, y) \rightarrow (x - 11, y + 4)$



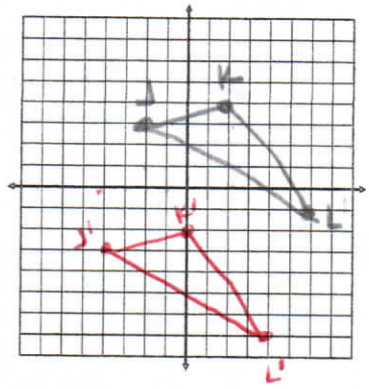
D' (-5, 5)

E' (-3, 4)

F' (-6, -2)

G' (-8, -1)

8. Triangle JKL with vertices $J(-2, 3)$, $K(2, 4)$, and $L(6, -1)$: $(x, y) \rightarrow (x - 2, y - 6)$

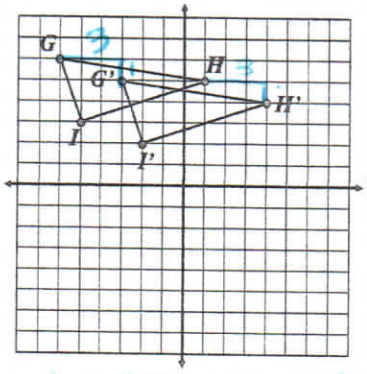


J' (-4, -3)

K' (0, -2)

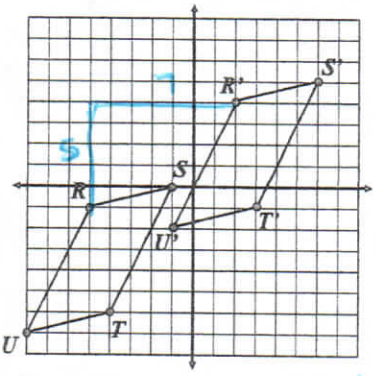
L' (4, -7)

9. Write a rule for the translation shown below:



Rule: $(x, y) \rightarrow (x + 3, y - 1)$

10. Write a rule for the translation shown below:



Rule: $(x, y) \rightarrow (x + 7, y + 5)$

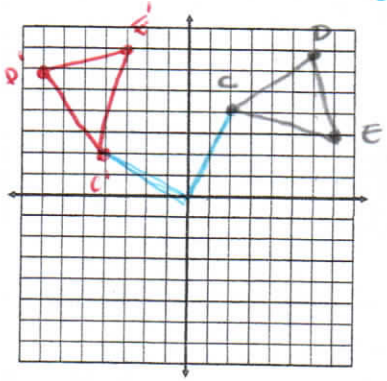
Topic 3: Rotations

Give each rule for counterclockwise rotations about the origin:

90°: $(x, y) \rightarrow$ $(-y, x)$ (CCW) **180°:** $(x, y) \rightarrow$ $(-x, -y)$ **270°:** $(x, y) \rightarrow$ $(y, -x)$ (CCW)

Directions: Graph and label each figure and its image under the given counterclockwise rotation about the origin.

11. Triangle CDE with vertices $C(2, 4)$, $D(6, 7)$, and $E(7, 3)$: **90°** CCW $(-y, x)$

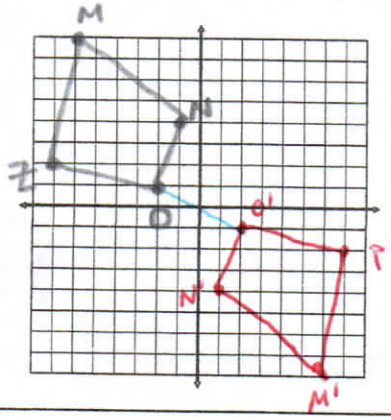


C' (-4, 2)

D' (-7, 6)

E' (-3, 7)

12. Quadrilateral $MNOP$ with vertices $M(-6, 8)$, $N(-1, 4)$, $O(-2, 1)$, and $Z(-7, 2)$: **180°** $(-x, -y)$



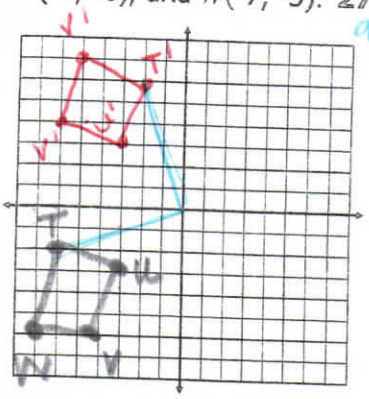
M' (6, -8)

N' (1, -4)

O' (2, -1)

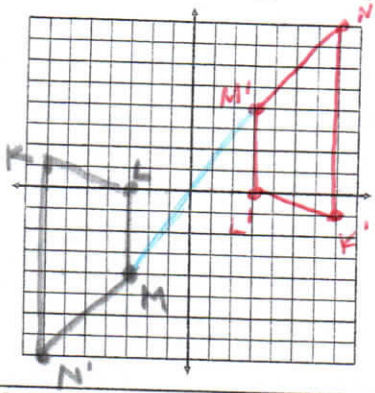
P' (7, -2)

13. Square $TUVW$ with vertices $T(-6, -2)$, $U(-3, -3)$, $V(-4, -6)$, and $W(-7, -5)$: **270°** CCW
90 CW $(y, -x)$



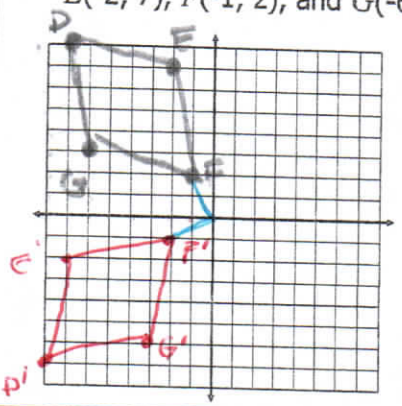
$T'(\underline{-2}, \underline{6})$
$U'(\underline{-3}, \underline{3})$
$V'(\underline{-6}, \underline{4})$
$W'(\underline{-5}, \underline{7})$

14. Trapezoid $KLMN$ with vertices $K(-7, 1)$, $L(-3, 0)$, $M(-3, -4)$, and $N(-7, -8)$: **180°**
$(-x, -y)$



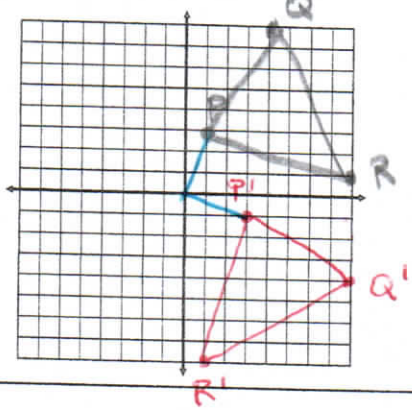
$K'(\underline{7}, \underline{-1})$
$L'(\underline{3}, \underline{0})$
$M'(\underline{3}, \underline{4})$
$N'(\underline{7}, \underline{8})$

15. Rhombus $DEFG$ with vertices $D(-7, 8)$, $E(-2, 7)$, $F(-1, 2)$, and $G(-6, 3)$: **90°** CCW
$(-y, x)$



$D'(\underline{-8}, \underline{-7})$
$E'(\underline{-7}, \underline{-2})$
$F'(\underline{-2}, \underline{-1})$
$G'(\underline{-3}, \underline{-6})$

16. Triangle PQR with vertices $P(1, 3)$, $Q(4, 8)$, and $R(8, 1)$: **270°** CCW 90° CW $(y, -x)$

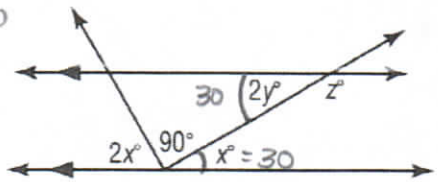


$P'(\underline{3}, \underline{-1})$
$Q'(\underline{8}, \underline{-4})$
$R'(\underline{1}, \underline{-8})$

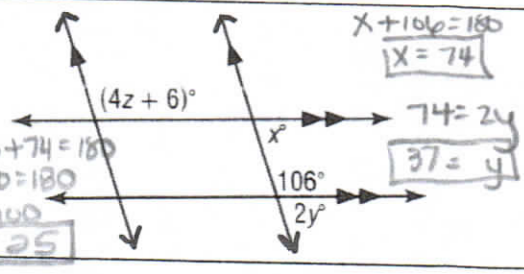
Topic 4: Parallel lines cut by a transversal

Directions: For problems #17–21 solve for the missing variable(s).

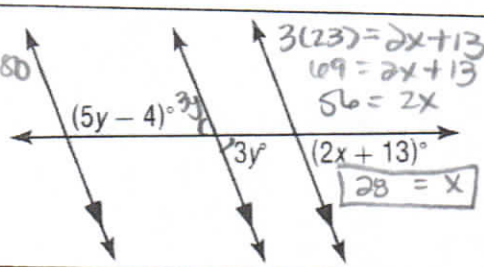
17.
$3x+90=180$
$3x=90$
$x=30$
$y=15$
$z=150$



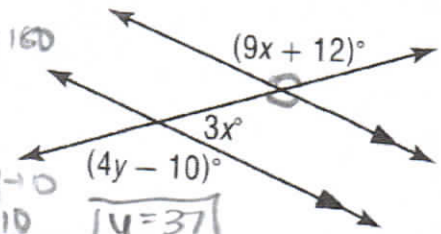
18.
$x+106=180$
$x=74$
$74=2y$
$37=y$
$4z+6+74=180$
$4z+80=180$
$4z=100$
$z=25$



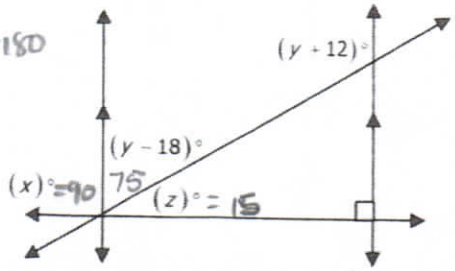
19.
$5y-4+3y=180$
$8y=184$
$y=23$
$3(23)=2x+13$
$69=2x+13$
$56=2x$
$28=x$



20.
$9x+12+3x=180$
$12x=168$
$x=14$
$9(14)+2=4y-10$
$138=4y-10$
$y=37$



21.
$y-18+y+12=180$
$2y-6=180$
$2y=186$
$y=93$



22. $148=4y$
In figure below $a \parallel b$, $m\angle 1 = 78°$, and $m\angle 2 = 47°$. Find measure of each angle.