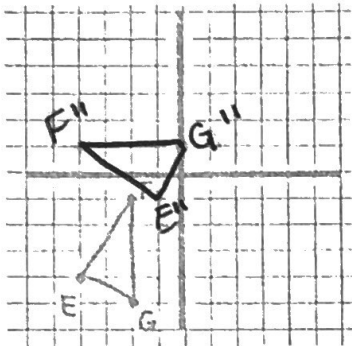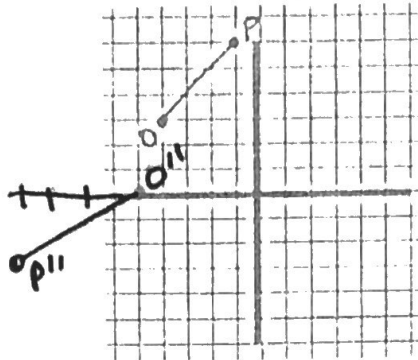Directions: Complete each sequence of transformations.
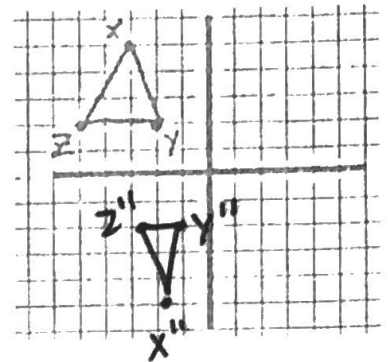
1) Translate 3 units right & 5 units up.
   Then, rotate 90°CCW about the origin.

2) Rotate 180° CCW about (−2, −1).
   Then, reflect over y = x.

3) Shrink horizontally by ½.
   Then, reflect over y = 0.

Directions: Find A″ given the sequence of transformations.

4) A(4, −2); Reflect over y = −x; then, dilate by a scale factor of 2 with the origin as a center

$$A''(4, -8)$$

5) A(0, −3); Rotate 90° CW about the origin; then, horizontally stretch by 3

$$A''(-9, 0)$$

6) A(−2, 2), Translate 6 units down; then, dilate by a scale factor of ½ with a center of (4, −1)

$$A''(1, -2.5)$$

Directions: Use the rule for the sequence of transformations to find B″.

7) $(x, y) \rightarrow ''(x - 3, -y)$ when B(4, 5)

$$B''(1, -5)$$

8) $(x, y) \rightarrow ''(y, 4x)$ when B(−1, 6)

$$B''(6, -4)$$

9) $(x, y) \rightarrow ''(-4x, y)$ when B(−5, −1)

$$B''(20, -1)$$

10) $(x, y) \rightarrow ''(-3y, 3x)$ when B(0, 2)

$$B''(-6, 0)$$

Directions: Describe the sequence of transformations displayed in each rule.

11) $(x, y) \rightarrow ''(x - 3, -y)$

left 3 & ref. over x-axis

12) $(x, y) \rightarrow ''(y, 4x)$

reflect over y=x & vert str by 4
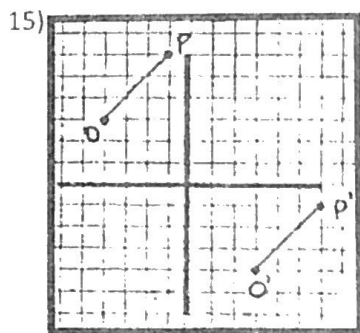OR
horz str by 4 & ref over y=x

13) $(x, y) \rightarrow ''(-4x, y)$
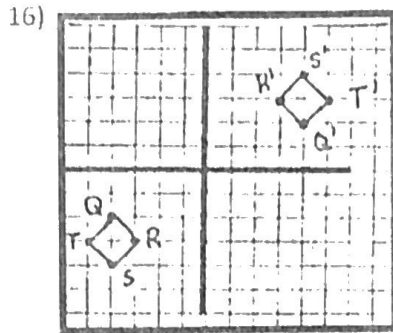
ref over y-axis & horz str by 4

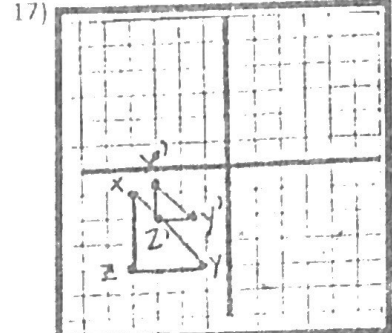14) $(x, y) \rightarrow ''(-3y, 3x)$

dil by 3 & 90°ccw rot.

Directions: Describe how each pre-image can be mapped onto the image using ONE transformation.
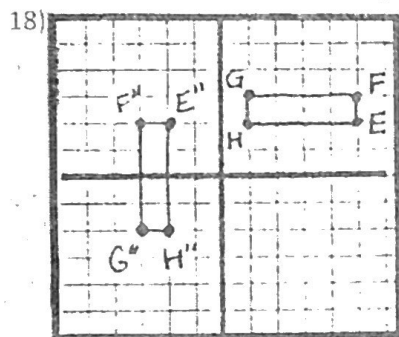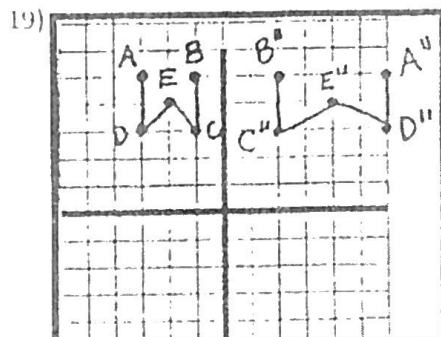
15)

ref over y=x

16)

rot 180° CW

17)
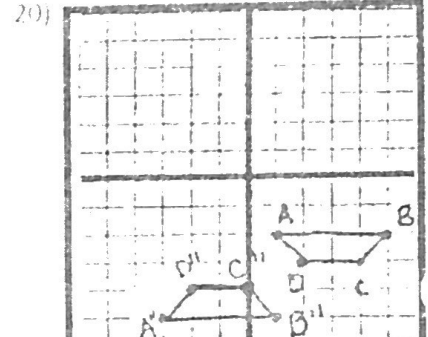
dil by ½ using
(-2,0) as the center

Directions: Describe how each pre-image can be mapped onto the image using TWO transformations.

18)

90° CCW rot
then down 3

19)

ref over y-axis
then horz str by 2

20)

ref over y=-3.5
then trans 4
units left

Directions: Describe how each pre-image can be mapped onto itself using the specified number of transformations.

21) A(3, 5) & B(2, 1);
   2 transformations involving 2 dilations
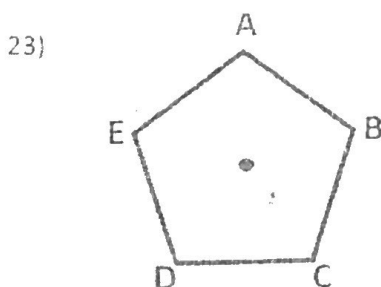
ex: dil by ½ then
   dil by 2 (ans will vary) ⟶

22) A(3, 5) & B(2, 1);
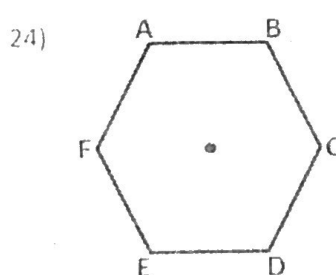   3 transformations using a rotation & 2 reflections

ex. ① ref over x-axis   ex. Rotate 180°
    ② rot 360° CW   Reflect x-axis
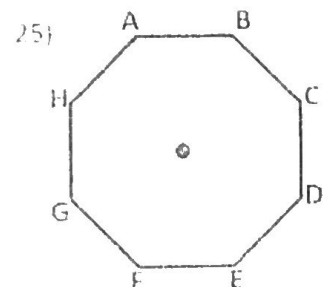   ③ ref over x-axis   Reflect y-axis

Directions: Circle each of the angle measures that would map the image onto itself through a rotation around the fixed point. Each polygon is a regular polygon.

23)

36°   ⟨72°⟩   90°   ⟨144°⟩

24)

90°   ⟨120°⟩   ⟨180°⟩   ⟨40°⟩

25)

⟨45°⟩   ⟨90°⟩   120°   ⟨585°⟩