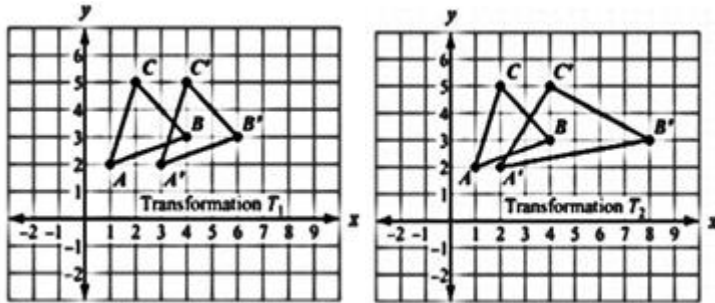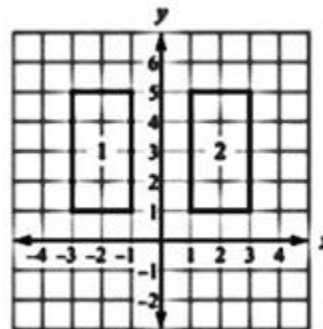**Directions: Solve each problem.**

1) In the given figures, explain how transformation T_1 is different from transformation T_2.
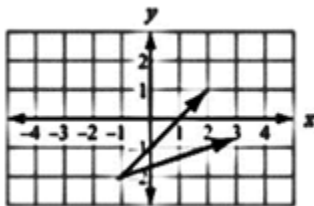
2) In the image below, explain 2 different ways to map Image 1 to Image 2 using only one transformation.
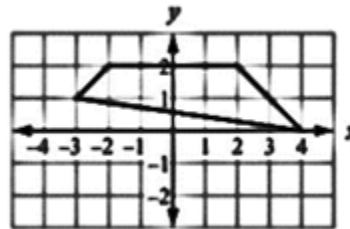

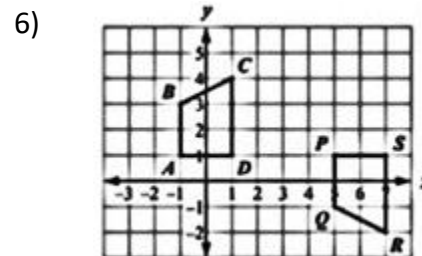**Directions: Draw the image of each figure using the given transformation.**
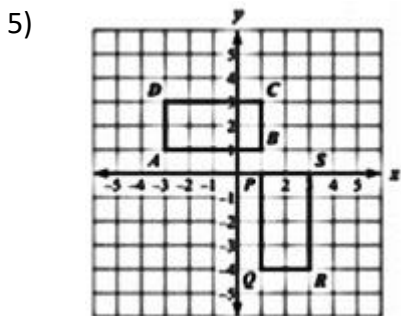
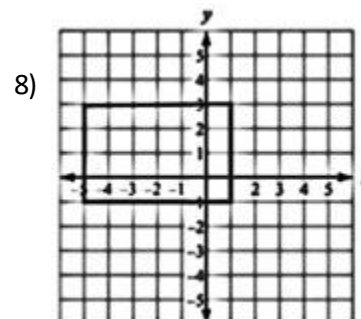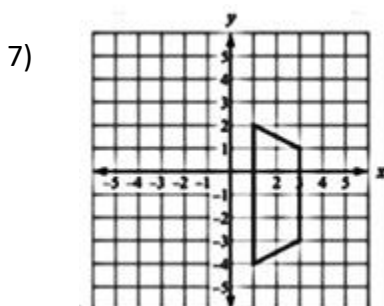3) Given the rule $(x, y) \rightarrow {}'(x - 3, y + 1)$

4) Reflect across the x-axis.

Directions: Describe the sequence of transformations that can be used to map ABCD to PQRS.

5)

6)

Direction: Describe every transformation that can map the image onto itself. (The pre-image maps onto the image using exactly one transformation.)

7)

8)

Directions: Select the best answer.

9) A segment has vertices at A (3, 5) and B (2, -1). What are the coordinates of B' if the segment has been reflected over $y = -2$?

      A. (2, -3)   B. (3, -1)   C. (2, 5)   D. (1, 5)

10) A triangle has vertices at A (-2, 2), B (-1, 2) and C (-1, 4). Which transformation would produce an image with vertices A' (2, 2), B' (1, 2) and C' (1, 4)?

    A. Reflection over $y = 0$ C. Rotation 90° CW about the origin

    B. Rotation 180° CCW about the origin   D. Reflection over the y-axis

11) A triangle has vertices at A (-2, 2), B (-1, 2) and C (-1, 4). Which transformation would produce an image with vertices A' (-6, 2), B' (-3, 2) and C' (-3, 4)?

    A. Dilation by a scale factor of 3   C. Vertical Stretch by 3

    B. Horizontal Stretch by 3   D. Translation left 4 units

12) A segment has vertices at G (6, 7) and H (3, 2). Which transformation would produce an image with vertices G'(-6, -7) and H' (-3, -2).

    A. 90° CCW rotation about the origin   C. 270° CCW rotation about the origin

   B. Reflection across $y = -x$ D. 180 ° CW rotation about the origin

13) A regular pentagon is centered about the origin and has a vertex at (0, 4). Which transformation maps the pentagon to itself?

    A. a reflection across line m
    B. a reflection across the x-axis
    C. a clockwise rotation of 100° about the origin
    D. a clockwise rotation of 144° about the origin
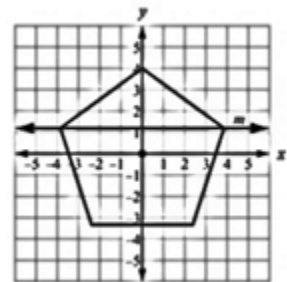
14) Given the figure, which transformation maps the parallelogram to itself?

    A. a reflection across the line x = 2
    B. a reflection across the line y = 2
    C. a rotation of 180° about the point (2, 2)
    D. a rotation of 180° about the origin
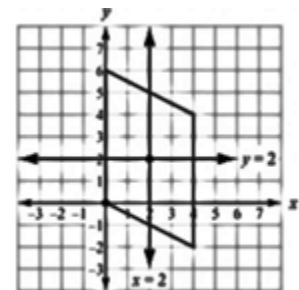
15) Which sequence of transformations maps ∆ABC to ∆RST?

    A. Reflect ∆ABC across the line x = –1.
       Then, translate the result 1 unit down.

    B. Reflect ∆ABC across the line x = –1.
       Then translate the result 5 units down.

    C. Translate ∆ABC 6 units to the right.
      Then, rotate the result 90° clockwise about the point (1, 1).

    D. Translate ∆ABC 6 units to the right. Then, rotate the result 90° counterclockwise about the point (1, 1).