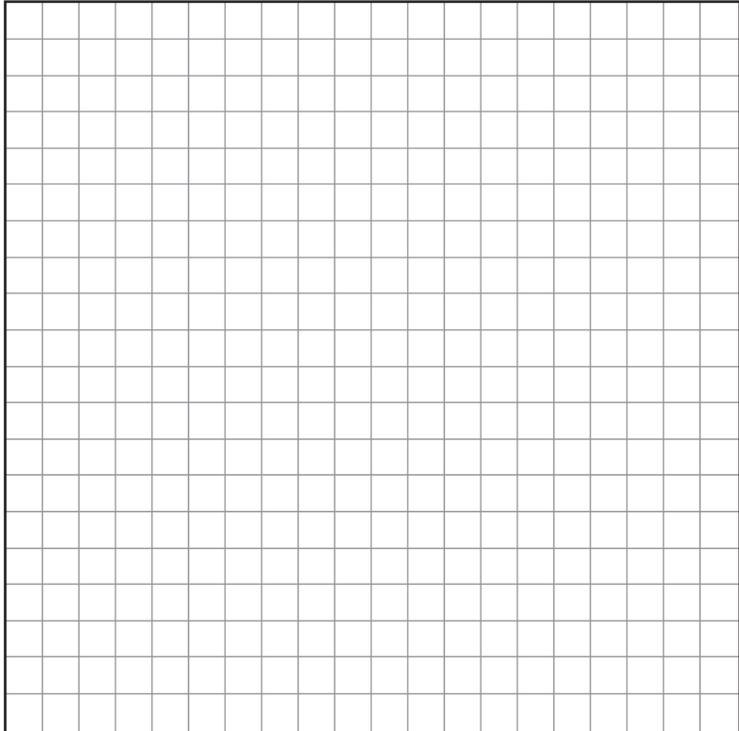Name: _____

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1. Which of the following is not an isometry?
   (1) line reflection   (3) dilation
   (2) point reflection   (4) rotation

2. Which of the following words has point symmetry?
   (1) pop   (3) mom
   (2) pod   (4) oz

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3. The image of the origin under a certain translation is the point (2, –6). The image of point (–3, –2) under the same translation is the point
   (1) $(-1,-8)$ (3) $\left(-\frac{3}{2},\frac{1}{3}\right)$
   (2) $(-6,12)$ (4) $(-5,4)$

4. What are the coordinates of $r_{x=4} \circ r_{y=3}(2,5)$?

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5. Which of the following transformations could map the point (1, 2) onto the point (3, 6)?
   (1) $T_{2,3}$ (3) D_3
   (2) $T_{3,2}$ (4) $r_{y=x}$

6. If the point (0, –4) is rotated 90° clockwise about the origin, its image is on the line
   (1) $y = x$ (3) $x = 0$
   (2) $y = -x$ (4) $y = 0$

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7. a) Sketch the graph of $\dfrac{(x-3)^2}{4} + \dfrac{(y+2)^2}{9} = 1$

   b) Reflect the given graph in the *x*-axis and write its new equation.

   c) Translate the given graph by $T_{-4,6}$ and state the new equation.

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8. Which transformation is an opposite isometry?
   (1) dilation   (3) rotation of 90°
   (2) line reflection   (4) translation

9. The composite transformation that reflects point P through the origin, the x-axis, and the line $y = x$, in the order given, is equivalent to which rotation?
   (1) $R_{90°}$ (3) $R_{270°}$
   (2) $R_{180°}$ (4) $R_{360°}$

10. In which quadrant would the image of point $(4, 5)$ fall after a dilation using a factor of -3?
    (1) I   (3) III
    (2) II   (4) IV

11. Which symbol has both point and line symmetry?
    (1) ♣   (3) ♥
    (2) ♦   (4) ♠

12. The centripetal force on an object moving in a circular path varies inversely as the radius of the circle. If a 55-pound force acts on an object traveling in a circular path with a radius of 10 feet, then what is the *diameter* of the circular path where the centripetal force acting on the object is 75 pounds?

13. What is the length of the major axis of the ellipse $36(x - 9)^2 + 9(y + 18)^2 = 324$?

14. a) On the accompanying grid, graph the equation $2y = 2x^2 - 4$ in the interval $-3 \le x \le 3$ and label it a.

    b) On the same grid, sketch the image of a under $T_{5,-2} \circ r_{x-\text{axis}}$ and label it b.