1. What is the image of point \((-3,-1)\) under a reflection in the origin?
   (1) (3,1)  (3) (1,3)
   (2) (-3,1) (4) (-1,-3)

2. Ms. Brewer’s art class is drawing reflected images. She wants her students to draw images reflected in a line. Which diagram represents a correctly drawn image?

3. Which image represents a line reflection?
   (1) \(P q\)  (3) \(P P\)
   (2) \(P A\)  (4) \(P P\)

4. Point \(A\) is located at \((4,-7)\). The point is reflected in the \(x\)-axis. Its image is located at
   (1) \((-4,7)\)  (3) \((4,7)\)
   (2) \((-4,-7)\)  (4) \((7,-4)\)
The accompanying graph shows the relationship between kinetic energy, $y$, and velocity, $x$.

The reflection of this graph in the line $y = x$ is

If point (5,2) is rotated counterclockwise 90° about the origin, its image will be point
1) (2, 5)  3) (-2, 5)
2) (2, -5)  4) (-5, -2)

What is the image of $(x,y)$ after a translation of 3 units right and 7 units down?
1) $(x + 3,y - 7)$  3) $(x - 3,y - 7)$
2) $(x + 3,y + 7)$  4) $(x - 3,y + 7)$

A polygon is transformed according to the rule: $(x,y) \rightarrow (x+2,y)$. Every point of the polygon moves two units in which direction?
1) up  3) left
2) down  4) right
9. A translation moves \( P(3,5) \) to \( P'(6,1) \). What are the coordinates of the image of point \((-3,-5)\) under the same translation?
(1) (0, -9)  (3) (-6, -1)
(2) (-5, -3)  (4) (-6, -9)

10. Triangle \( ABC \) has vertices \( A(1,3) \), \( B(0,1) \), and \( C(4,0) \). Under a translation, \( A' \), the image point of \( A \), is located at \( (4,4) \). Under this same translation, point \( C \) is located at
(1) (7,1)  (3) (3,2)
(2) (5,3)  (4) (1, -1)

11. Which letter has point symmetry?
(1) A  (3) H
(2) B  (4) W

12. Which letter has both point and line symmetry?
(1) Z  (3) C
(2) T  (4) H

13. Which letter has point symmetry but not line symmetry?
(1) H  (3) T
(2) S  (4) X

14. Which diagram shows a dotted line that is not a line of symmetry?

\[\text{Diagram Options}\]
(1) \[\text{Diagram Image}\]
(2) \[\text{Diagram Image}\]
(3) \[\text{Diagram Image}\]
(4) \[\text{Diagram Image}\]
15 Which geometric shape does not have any lines of symmetry?

(1) Circle

(2) Square

(3) Trapezoid

(4) Parallelogram

16 Which transformation produces a figure similar but not congruent to the original figure?

(1) $T_{1,3}$

(2) $D_{1/2}$

(3) $R_{90^\circ}$

(4) $r_{y=x}$

17 Which type of transformation is $(x, y) \rightarrow (x + 2, y - 2)$?

(1) dilation

(2) reflection

(3) rotation

(4) translation

18 Which transformation is illustrated by the accompanying diagram?

(1) translation

(2) reflection

(3) rotation

(4) dilation

19 Which transformation produces a figure that is always the mirror image of the original figure?

(1) line reflection

(2) dilation

(3) translation

(4) rotation
20 The accompanying diagram shows the transformation of $\triangle XYZ$ to $\triangle X'Y'Z'$.

This transformation is an example of a
(1) line reflection          (3) translation
(2) rotation                (4) dilation

21 Which transformation does not always result in an image that is congruent to the original figure?
(1) dilation                 (3) rotation
(2) reflection               (4) translation

22 The perimeter of $\triangle A'B'C'$, the image of $\triangle ABC$, is twice as large as the perimeter of $\triangle ABC$. What type of transformation has taken place?
(1) dilation                 (3) rotation
(2) translation              (4) reflection

23 Which type of transformation is illustrated in the accompanying diagram?

(1) dilation                  (3) translation
(2) reflection                (4) rotation
24. In the accompanying diagram, which transformation changes the solid-line parabola to the dotted-line parabola?

(1) translation  (3) rotation, only
(2) line reflection, only  (4) line reflection or rotation

25. Point $P'$ is the image of point $P(-3, 4)$ after a translation defined by $T_{(7, -1)}$. Which other transformation on $P$ would also produce $P'$?

(1) $r_{y=-x}$  (3) $R_{90^\circ}$
(2) $r_{y-axis}$  (4) $R_{-90^\circ}$

26. Construct the line of reflection:
27 Construct the center of rotation, then prove you have found it.

28 Reflect triangle ABC over line DE to form triangle A'B'C'