1) The resulting \( \triangle R'S'T' \) is an example of what kind of transformation?

A) rotation
B) translation
C) reflecting across y-axis
D) reflecting across x-axis

**Explanation:**
If the image is just not moved a certain distance from the original, then it is not a translation. If the image is a mirror image of the original then it is a reflection, just determine which axis it crossed. In this case it is reflection across the y-axis.
2) Which transformation shows a translation of 3 units to the right?
   A) 
   B) 
   C) 
   D) 

Explanation:
The solution is B. The “P” in choice B has been translated 3 units to the right.

3) Which best describes the transformation that occurs in the graph?
   A) Dilation
   B) Reflection
   C) Rotation
   D) Translation

Explanation:
The object is a mirror image and not just movement of points; so the only possible answer is reflection.
4) The triangle is transformed as shown in the diagram. Describe the transformation.
   A) dilation, then reflection
   B) rotation, then reflection
   C) reflection, then rotation
   D) translation, then reflection

   **Explanation:**
   The solution is reflection, then rotation. The triangle has been reflected across the y-axis and then rotated.

5) Describe the transformation.
   A) Translation 2 units down
   B) Reflection across y = -1
   C) Reflection across the x-axis
   D) Reflection across the y-axis

   **Explanation:**
   The transformation is a Reflection across the x-axis. If the graph was folded along the x-axis, the A's will match up.
Which transformation shows a translation 4 units down?

A)  
B)  
C)  
D)  

**Explanation:**
The solution is C. The ‘P’ in choice C has been translated 4 units down.
7) The triangle 1 is transformed as shown in the diagram, resulting in triangle 3. Describe the transformations.

A) dilation, then reflection
B) rotation, then translation
C) reflection, then translation
D) translation, then reflection

Explanation:
The solution is translation, then reflection. The triangle has been translated 4 units to the right and then reflected across the x-axis.
The figure is transformed as shown in the diagram. Describe the transformation.

A) dilation, then reflection
B) reflection, then rotation
C) rotation, then translation
D) translation, then reflection

**Explanation:**
The solution is **rotation, then translation**. The figure has been rotated about the origin by 90° and then translated 6 units to the right.
9) The figure is transformed as shown in the diagram. Describe the transformation.

A) reflection, then rotation
B) translation, then dilation
C) translation, then reflection
D) reflection, then translation

Explanation:
The figure has been transformed as a result of a reflection, then rotation. It has been reflected across the y-axis and rotated clockwise about the origin.

10) The figure is transformed as shown in the diagram. Describe the transformation.

A) reflection, then rotation
B) rotation, then reflection
C) reflection, then dilation
D) translation, then dilation

Explanation:
The figure has been transformed as a result of a rotation, then reflection. It has been rotated counterclockwise about the origin and then reflected across the y-axis.
11) Triangle ABC is reflected across the x-axis, and then across the y-axis. Which rotation is equivalent to this composition of transformations?
   A) 45 degree rotation
   B) 90 degree rotation
   C) **180 degree rotation**
   D) 360 degree rotation

**Explanation:**
An **180 degree rotation** is equivalent to the two reflections described. If you rotate each vertex by 180 degrees, the vertices end up at A', B', and C'.

12) If you rotate a right triangle, what feature of the triangle changes?
   A) leg lengths
   B) angle measures
   C) length of hypotenuse
   D) **position of the triangle**

**Explanation:**
When transforming a figure using rotations, the angles and sides keep the same measure. The only thing that changes is the **position of the triangle**.
The figure is transformed as shown in the diagram. Describe the transformation.

A) dilation, then reflection
B) reflection, then rotation
C) rotation, then reflection
D) rotation, then translation

Explanation:
The solution is rotation, then reflection. The figure has been rotated clockwise about the origin and then reflected across the x-axis.
Which transformation will move polygon ABCD from quadrants II and III to quadrants I and IV?

A) up 5 units
B) left three units
C) reflect over the x-axis
D) reflect over the y-axis

Explanation:
If you reflect over the y-axis the polygon will move from quadrant II and III to I and IV.
The transformation of triangle ABC is an example of what?

A) A dilation of 2.
B) Translation of (0, 8)
C) Translation of (0, -8)
D) A reflection across the y-axis

**Explanation:**
A mirror image would have flipped the drawing so it is not a reflection, so it must be a translation. The only movement was on the y-values, they dropped or decreased by 8, so the **translation is (0, -8)**.
IMAGES NEED TO BE SEPARATED - Which transformation is the result of reflecting the original figure across the y-axis and then across the x-axis?

A)  
B)  
C)  
D)

Explanation:
Solution: D. The triangle in choice D was first reflected across the y-axis, and then across the x-axis.
Which transformation will move polygon ABCD completely into one quadrant?

A) up 5 units  
B) down 5 units  
C) left three units  
D) reflect over the x-axis

Explanation:
If you move ABCD up 5 units the points below the x-axis will move above the x-axis and the polygon will be in one quadrant.
Triangle ABC has been transformed into triangle A'B'C'. The algebraic formula for this transformation is

A) \((x', y') = (2x, y)\)
B) \((x', y') = (x, 2y)\)
C) \((x', y') = (2x, 2y)\)
D) \((x', y') = (2y, 2x)\)

**Explanation:**
\((x', y') = (2x, 2y)\) is correct. This is a dilation in the origin by a factor of 2.
A rotation in the origin is shown. The angle of rotation appears to be

A) 30°.
B) 45°.
C) 60°.
D) 90°.

Explanation:
90° is correct. If we compare one of the blue sides with its red image, we can see the 90-degree angle formed at the origin.
What transformations (listed in order) were used to move the figure on the left to the one on the right?

A) translate left 8 and up 2
B) translate left 1, translate up 2, and reflect over y-axis
C) translate left 1, translate up 2, and reflect over x-axis
D) reflection over y-axis, translate left 1 and translate down 2

**Explanation:**
Since the sides switched you know you must have a reflection over the y-axis. If you reflect the original figure first you would then have to translate it right and up to superimpose it on top of the resulting image. The correct order is reflection over y-axis, translate left 1 and translate down 2.
21) The graph shows a rectangle that has been translated. Which statement is FALSE?

A) The angles of the rectangle remained 90°.
B) The parallel lines of the rectangle remained parallel.
C) The segments of the rectangle remained the same length.
D) The rectangle retained its same position on the coordinate plane.

Explanation:
When transforming a figure using rotations, reflections, and translations, the angles and sides keep the same measure and parallel lines remain parallel. The only thing that changes is its position in the coordinate plane. Therefore the only false statement is "the rectangle retained its same position on the coordinate plane."
The small rectangle has been dilated to form the large one.

If the point \((x, y)\) is on the small rectangle, then which point must be on the large rectangle?

A) \((x, y)\)
B) \((x, 2y)\)
C) \((2x, y)\)
D) \((2x, 2y)\)

Explanation:
\((2x, 2y)\) is correct. Since the factor of the dilation is 2, each coordinate is doubled.
23) The vertices of a triangle are A(4,5), B(7,1), and (9,6). After reflecting over the line x = 5, what are the new coordinates?

A) A'(5,6), B'(1,3), C'(6,1)
B) A'(6,5), B'(3,1), C'(1,6)
C) A'(5,5), B'(5,1), C'(5,6)
D) A'(5,4), B'(5,7), C'(5,6)

Explanation:
A'(6,5), B'(3,1), C'(1,6)

The y-values will not change as you are doing a horizontal reflection. The x-coordinate of the new vertices remain the same distance from x = 5 as the original vertices, just on the opposite side.

24) A triangle in the coordinate plane has coordinates of (2,3), (-4,-5), and (-2, 4). It is translated 3 units down. What are its new coordinates?

A) (5,3), (-1,-5), (1,4)
B) (2,6), (-4,-2), (-2, 7)
C) (2,0), (-4,-8), (-2, 1)
D) (-1,3), (-7,-5), (-5,4)

Explanation:
If we move three units down, we need to subtract 3 from each y-coordinate. The correct answer is (2,0), (-4,-8), (-2, 1).

25) A triangle in the coordinate plane has coordinates of (2,3), (-4,-5), and (-2, 4). It is reflected about the y-axis. What are its new coordinates?

A) (-2,3), (4,-5), (2,4)
B) (-2,-3), (4,5), (2,-4)
C) (2,-3), (-4,5), (-2,-4)
D) (-2,-3), (-4,-5), (-2,-4)

Explanation:
If we reflect across the y-axis, the x-coordinate changes signs. The correct answer is (-2,3), (4,-5), (2,4).
26) A triangle in the coordinate plane has coordinates of (2,3), (-4,-5), and (-2, 4). It is reflected about the x-axis. What are its new coordinates?
   A) (-2,3), (4,-5), (2,4)
   B) (-2,-3), (4,5), (2,-4)
   C) (2,-3), (-4,5), (-2,-4)
   D) (-2,-3), (-4,-5), (-2,-4)

Explanation:
If we reflect across the x-axis, the y-coordinate changes signs. The correct answer is (2,-3), (-4,5), (-2,-4).

27) When a polygon reflects across the y-axis, how do the coordinates of the points change?
   A) The sign of the x-coordinate changes.
   B) The sign of the y-coordinate changes.
   C) The sign of both the x and y coordinates change.
   D) The x and y coordinates are switched and the signs of both change.

Explanation:
The sign of the x-coordinate changes.

The points flip across the y-axis, but they remain the same distance from the y-axis.
28) A translation of trapezoid PQRS (blue) to trapezoid P'Q'R'S' (green) is shown, where the location of Q' is the origin. The coordinates of point R' are

A) (-a, -b)  
B) (d - a, -b)  
C) (c - a, -b)  
D) (-c, b - d)

Explanation:
(c - a, -b) is correct. Since Q' is (0, 0), we see that the transformation is (x', y') = (x - a, y - b), so plugging in R, we get (c', 0') = (c - a, 0 - b), or (c - a, -b).

29) A triangle in the coordinate plane has coordinates of (3,5), (1,-3), and (-3, 4). It is translated so that its new coordinates are (1,7), (-1,-1), and (-5, 6). What transformation occurred?

A) It moved up two units and left two units.  
B) It moved up two units and right two units.  
C) It moved down two units and left two units.  
D) It moved down two units and right two units.

Explanation:
Since you subtracted two from the x-coordinate and added two to the y-coordinate, **it moved up two units and left two units.**
30) Which BEST describes a horizontal stretch?

A) The graph is compressed toward the y-axis.
B) The graph is stretched away from the y-axis.
C) The graph is stretched away from the x-axis.
D) The graph is stretched away from the x-axis and the y-axis.

Explanation:
The graph is stretched away from the y-axis.

As the x-values are multiplied by a factor greater than 1 (a horizontal stretch) they move farther away from the y-axis.