Lesson 1.2.4

1-81. Rotations are shown below. See the “Suggested Lesson Activity” for a description of expected responses.

\[ \text{a. } 180^\circ \quad \text{b. } 180^\circ \quad \text{c. } 90^\circ \quad \text{d. } 90^\circ \]

\[ \text{e. } 270^\circ \quad \text{f. } 360^\circ \quad \text{g. } 180^\circ \quad \text{h. } 90^\circ \]

1-82. See below.

a. \( A' \) should be at \((-1, 4)\), and \( B' \) should be at \((-5, 2)\).

b. \( OA = OA' \), \( OB = OB' \), and \( m\angle AOA' = m\angle BOB' \)

c. A rotation keeps the distance between all points on the tracing paper and the point of rotation constant. In addition, the definition of the measure of an angle is the number of degrees of rotation of one ray to another about a common vertex. Thus all points are rotated so that the angles formed by rays from the center of rotation to an original point and to its image have equal measure.

d. As the tracing paper is moved, it is not stretched or distorted. All points remain a fixed distance from each other and angles are not altered.

1-83. See below.

a. 7 units to the right and 3 units down.

b. \( E' (11, -1) \), \( F' (8, 4) \), \( G' (9, -3) \)

c. The line segments are all congruent and parallel. A translation moves each point the same distance in the same direction.

d. As the tracing paper is moved, it is not stretched or distorted. All points remain a fixed distance from each other and angles are not altered.

1-84. See below.

a. While an isosceles triangle is formed, students may not yet recognize that the triangle is special. Part (b) will require students to focus on particular characteristics of this shape.

b. The triangle has two equal sides due to reflection. The angles opposite the equal sides are also equal. The line of reflection divides the third side into two equal pieces, and is perpendicular to that side.
1-85. See below.

a. Yes. It has four sides. \( m_{AB} = m_{CD} = \frac{1}{2} \) and \( m_{BC} = m_{AD} = -2 \), so each pair of consecutive sides is perpendicular and forms 90° angles.

b. \( A'(4, 3) \) \( B'(6, -1) \), \( C'(-2, -5) \), \( D'(-4, -1) \)

1-86. See below.

a. \( x = -4.75 \)

b. \( x = -94 \)

c. \( x = 1.14 \)

d. \( a = 22 \)

1-87. See below.

a. There are 10 combinations: a & b, a & c, a & d, a & e, b & c, b & d, b & e, c & d, c & e, d & e

b. Yes. If the outcomes are equally likely, we can use the theoretical probability computation in the Math Notes box in Lesson 1.2.1.

c. \( \frac{3}{10} \)

d. \( \frac{9}{10} \)

e. The outcomes that satisfy part (d) include the outcomes that satisfy part (c), but there are others on the part (d) list as well.

1-88. See below.

a. \( y = \frac{4}{3} x - 2 \)

b. The resulting line coincides with the original line; \( y = \frac{4}{3} x - 2 \)

c. The image is parallel; \( y = \frac{4}{3} x - 7 \)

d. They are parallel, because they all have a slope of \( \frac{4}{3} \).

e. \( y = -\frac{3}{4} x + 16 \)

1-89. See below.

a. \( -14 \)