

## Answer Key - Describing Rotations

1. A rotation can be described by giving a center of rotation and an angle of rotation. Rotations are usually assumed to be in the counterclockwise direction.
2. A circle looks the same after it has been rotated any amount about its center; a square looks the same after it has been rotated by  $90^\circ$  about its center (which can be found as the intersection of the two diagonals). The letter Z looks the same after a rotation of  $180^\circ$ . There are many other shapes that look the same after rotation. Usually, the angle of rotation that leaves a shape looking the same depends on the shape. The center of rotation must be at the center of the shape.
3. The net effect is one rotation with angle measure equal to the sum of the angle measures of the two rotations (as long as the center of rotation is the same for both rotations).
4. To completely determine a rotation, you must know the center of rotation, the angle of rotation, and the direction of rotation. Generally, you can assume that positive angles mean a counterclockwise rotation and that negative angles mean a clockwise rotation.
5. If a figure is rotated  $360^\circ$ , it looks exactly the same as if it had not been rotated at all. In fact, a rotation of  $360^\circ$  gives the same result as a rotation through  $0^\circ$ , which is like not rotating at all.
6. If a figure is rotated through an angle of more than  $360^\circ$ , it looks the same as if it had been rotated by an angle less than  $360^\circ$ . To find this angle, subtract  $360^\circ$  or multiples of  $360^\circ$  until you get  $0^\circ$  or a positive angle less than  $360^\circ$ .