Name ___________________________________________ Date ______________________

1. Use the figure below to complete parts (a) and (b).

   a. Use a compass and ruler to produce an image of the figure with center $O$ and scale factor $r = 2$.

   b. Use a ruler to produce an image of the figure with center $O$ and scale factor $r = \frac{1}{2}$. 
2. Use the diagram below to answer the questions that follow.

Let $D$ be the dilation with center $O$ and scale factor $r > 0$ so that $Dilation(P) = P'$ and $Dilation(Q) = Q'$.

![Diagram](image)

a. Use lengths $|OQ| = 10$ units and $|OQ'| = 15$ units to determine the scale factor $r$ of dilation $D$. Describe how to determine the coordinates of $P'$ using the coordinates of $P$.

b. If $|OQ| = 10$ units, $|OQ'| = 15$ units, and $|P'Q'| = 11.2$ units, determine $|PQ|$. Round your answer to the tenths place, if necessary.
3. Use a ruler and compass, as needed, to answer parts (a) and (b).

a. Is there a dilation $D$ with center $O$ that would map figure $PQRS$ to figure $P'Q'R'S'$? Explain in terms of scale factor, center, and coordinates of corresponding points.
b. Is there a dilation $D$ with center $O$ that would map figure $PQRS$ to figure $P'Q'R'S'$? Explain in terms of scale factor, center, and coordinates of corresponding points.
c. Triangle $ABC$ is located at points $A(-4, 3)$, $B(3, 3)$, and $C(2, -1)$ and has been dilated from the origin by a scale factor of 3. Draw and label the vertices of triangle $ABC$. Determine the coordinates of the dilated triangle $A'B'C'$, and draw and label it on the coordinate plane.