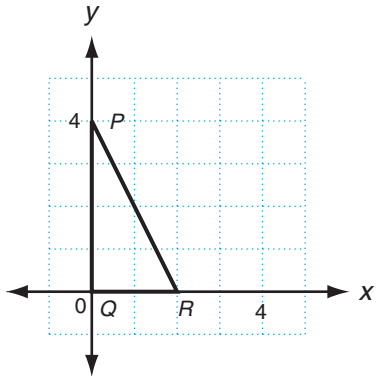
EXPLORATION

8-5 Dilations and Similarity in the Coordinate Plane

Use graph paper to explore similarity in the coordinate plane.

1. Write down the vertices of $\triangle PQR$.



2. Multiply each coordinate of each vertex of $\triangle PQR$ by 3. Then graph $\triangle P'Q'R'$ with these new vertices. How is $\triangle P'Q'R'$ related to $\triangle PQR$?

3. Now multiply each coordinate of each vertex of $\triangle PQR$ by $\frac{1}{2}$. Then graph $\triangle P''Q''R''$ with these new vertices. How is $\triangle P''Q''R''$ related to $\triangle PQR$?

4. A *dilation* is a transformation that changes the size of a figure but not its shape. For a dilation with a *scale factor* of k, you can find the image of a point by multiplying each coordinate by k: $(a, b) \rightarrow (ka, kb)$. What is the scale factor of the dilation that mapped $\triangle PQR$ to $\triangle P'Q'R'$?

5. What is the scale factor of the dilation that mapped $\triangle PQR$ to $\triangle P''Q''R''$?

THINK AND DISCUSS

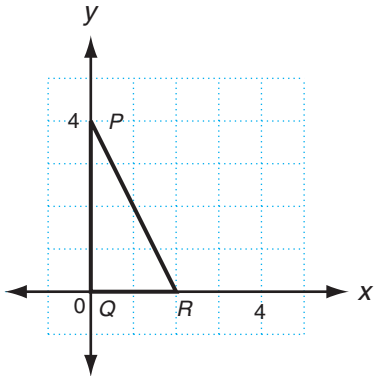
6. **Describe** how to find the image of the point $(12, -15)$ under a dilation with scale factor $\frac{2}{3}$.

EXPLORATION

8-5 Dilations and Similarity in the Coordinate Plane

Use graph paper to explore similarity in the coordinate plane.

1. Write down the vertices of $\triangle PQR$.
   $P(0, 4)$, $Q(0, 0)$, $R(2, 0)$



2. Multiply each coordinate of each vertex of $\triangle PQR$ by 3. Then graph $\triangle P'Q'R'$ with these new vertices. How is $\triangle P'Q'R'$ related to $\triangle PQR$? $\triangle P'Q'R' \sim \triangle PQR$

3. Now multiply each coordinate of each vertex of $\triangle PQR$ by $\frac{1}{2}$. Then graph $\triangle P''Q''R''$ with these new vertices. How is $\triangle P''Q''R''$ related to $\triangle PQR$? $\triangle P''Q''R'' \sim \triangle PQR$

4. A *dilation* is a transformation that changes the size of a figure but not its shape. For a dilation with a *scale factor* of k, you can find the image of a point by multiplying each coordinate by k: $(a, b) \rightarrow (ka, kb)$. What is the scale factor of the dilation that mapped $\triangle PQR$ to $\triangle P'Q'R'$? 3

5. What is the scale factor of the dilation that mapped $\triangle PQR$ to $\triangle P''Q''R''$? $\frac{1}{2}$

THINK AND DISCUSS

6. **Describe** how to find the image of the point $(12, -15)$ under a dilation with scale factor $\frac{2}{3}$. Multiply each coord. by $\frac{2}{3}$: $(8, -10)$.