Lesson Summary

Dilation has a multiplicative effect on the coordinates of a point in the plane. Given a point \((x, y)\) in the plane, a dilation from the origin with scale factor \(r\) moves the point \((x, y)\) to \((rx, ry)\).

For example, if a point \((3, -5)\) in the plane is dilated from the origin by a scale factor of \(r = 4\), then the coordinates of the dilated point are \((4 \cdot 3, 4 \cdot (-5)) = (12, -20)\).

Problem Set

1. Triangle \(ABC\) is shown on the coordinate plane below. The triangle is dilated from the origin by scale factor \(r = 4\). Identify the coordinates of the dilated triangle \(A'B'C'\).
2. Triangle $ABC$ is shown on the coordinate plane below. The triangle is dilated from the origin by scale factor $r = \frac{5}{4}$. Identify the coordinates of the dilated triangle $A'B'C'$.

3. The triangle $ABC$ has coordinates $A(6, 1)$, $B(12, 4)$, and $C(-6, 2)$. The triangle is dilated from the origin by a scale factor $r = \frac{1}{2}$. Identify the coordinates of the dilated triangle $A'B'C'$. 

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4. Figure $DEFG$ is shown on the coordinate plane below. The figure is dilated from the origin by scale factor $r = \frac{3}{2}$. Identify the coordinates of the dilated figure $D'E'F'G'$, and then draw and label figure $D'E'F'G'$ on the coordinate plane.

5. Figure $DEFG$ has coordinates $D(1, 1), E(7, 3), F(5, -4)$, and $G(-1, -4)$. The figure is dilated from the origin by scale factor $r = 7$. Identify the coordinates of the dilated figure $D'E'F'G'$. 