Lesson 6: Dilations on the Coordinate Plane

Classwork

Exercises 1–5

1. Point $A=(7, 9)$ is dilated from the origin by scale factor $r=6$. What are the coordinates of point $A'$?
2. Point $B=(-8, 5)$ is dilated from the origin by scale factor $r=\frac{1}{2}$. What are the coordinates of point $B'$?
3. Point $C=(6, -2)$ is dilated from the origin by scale factor $r=\frac{3}{4}$. What are the coordinates of point $C'$?
4. Point $D=(0, 11)$ is dilated from the origin by scale factor $r=4$. What are the coordinates of point $D'$?
5. Point $E=(-2, -5)$ is dilated from the origin by scale factor $r=\frac{3}{2}$. What are the coordinates of point $E'$?

Exercises 6–8

1. The coordinates of triangle $ABC$ are shown on the coordinate plane below. The triangle is dilated from the origin by scale factor $r=12$. Identify the coordinates of the dilated triangle $A'B'C'$.
2. Figure $DEFG$ is shown on the coordinate plane below. The figure is dilated from the origin by scale factor $r=\frac{2}{3}$. 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.
3. The triangle $ABC$ has coordinates $A=\left(3, 2\right)$,$ B=\left(12, 3\right)$, and $C=(9, 12)$. Draw and label triangle $ABC$ on the coordinate plane. The triangle is dilated from the origin by scale factor $r=\frac{1}{3}.$ Identify the coordinates of the dilated triangle $A'B'C'$, and then draw and label triangle $A^{'}B^{'}C^{'}$ on the coordinate plane.



Problem Set

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 $\left(r×x, r×y\right).$

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 $\left(4×3, 4×\left(-5\right)\right)=\left(12, -20\right).$

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 $A'B'C'$.



1. 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 $A'B'C'$.



1. The triangle $ABC$ has coordinates $A=\left(6, 1\right)$,$ 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 $A'B'C'$.
2. 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.



1. Figure $DEFG$ has coordinates $D=\left(1, 1\right)$, $E=\left(7, 3\right)$,$ 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 $D^{'}E^{'}F^{'}G^{'}.$