

## Lesson 6: Dilations on the Coordinate Plane

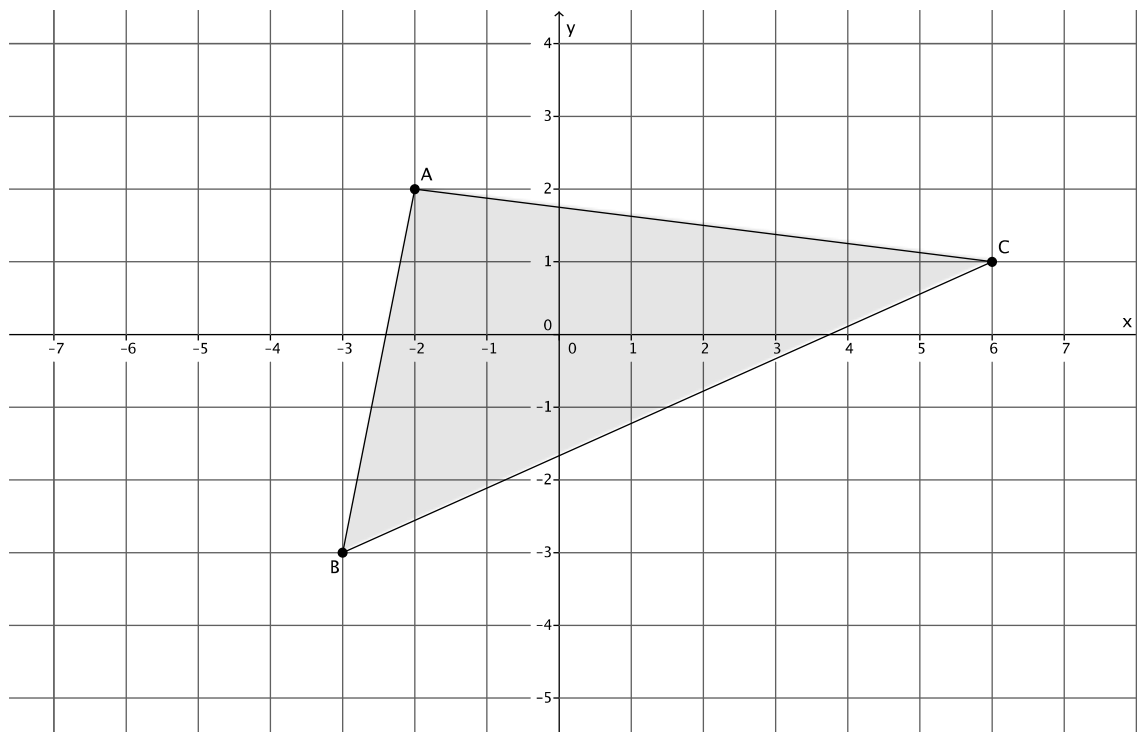
### Classwork

#### Exercises 1–5

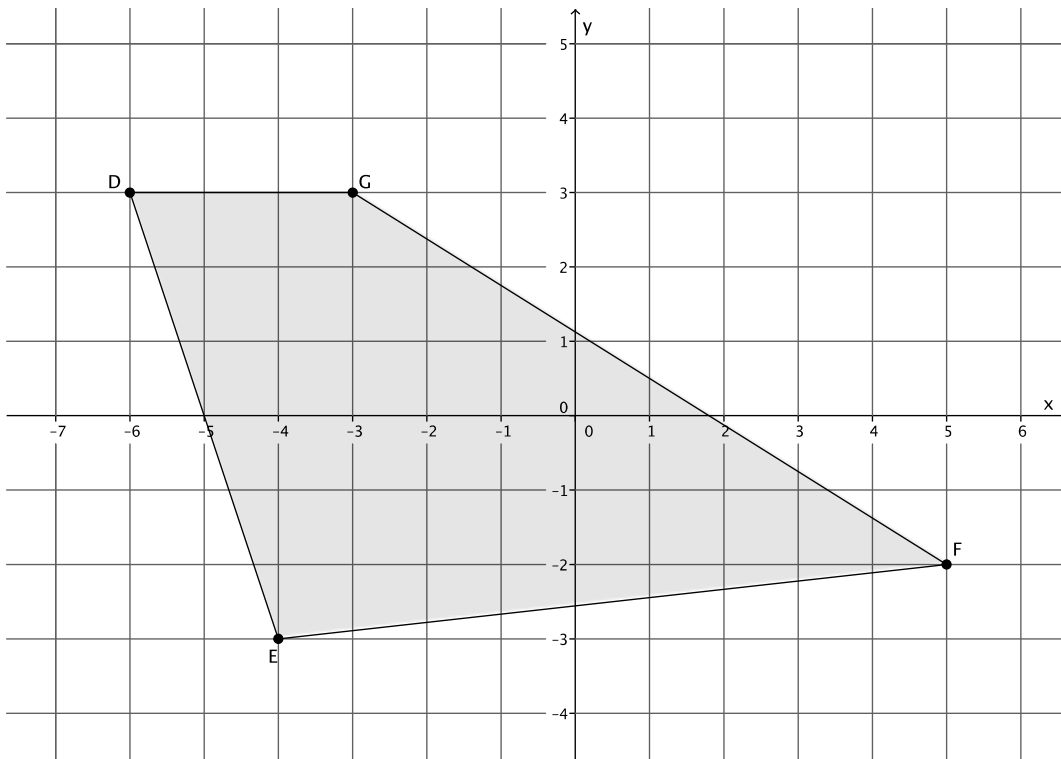
1. Point  $A(7, 9)$  is dilated from the origin by scale factor  $r = 6$ . What are the coordinates of point  $A'$ ?
2. Point  $B(-8, 5)$  is dilated from the origin by scale factor  $r = \frac{1}{2}$ . What are the coordinates of point  $B'$ ?
3. Point  $C(6, -2)$  is dilated from the origin by scale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

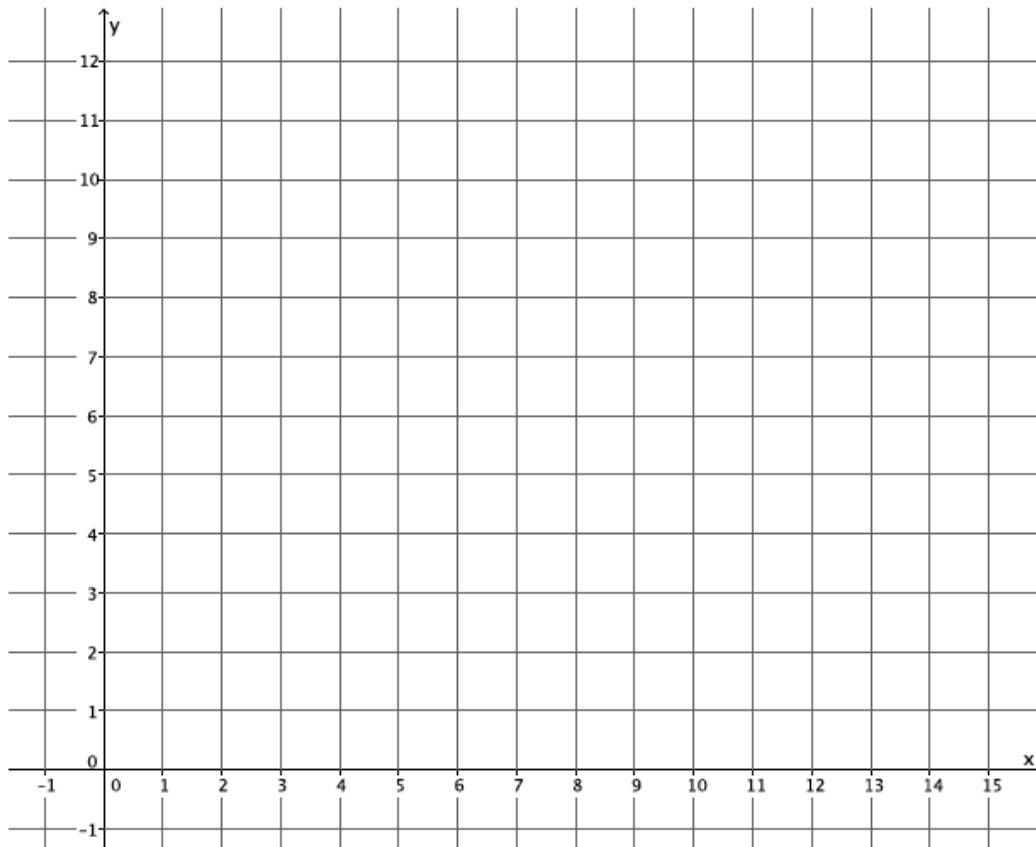
6. The coordinates of triangle  $ABC$  are shown on the coordinate plane below. The triangle is dilated from the origin by scale factor  $r = 12$ . Identify the coordinates of the dilated triangle  $A'B'C'$ .



7. 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.



8. The triangle  $ABC$  has coordinates  $A(3, 2)$ ,  $B(12, 3)$ , 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.



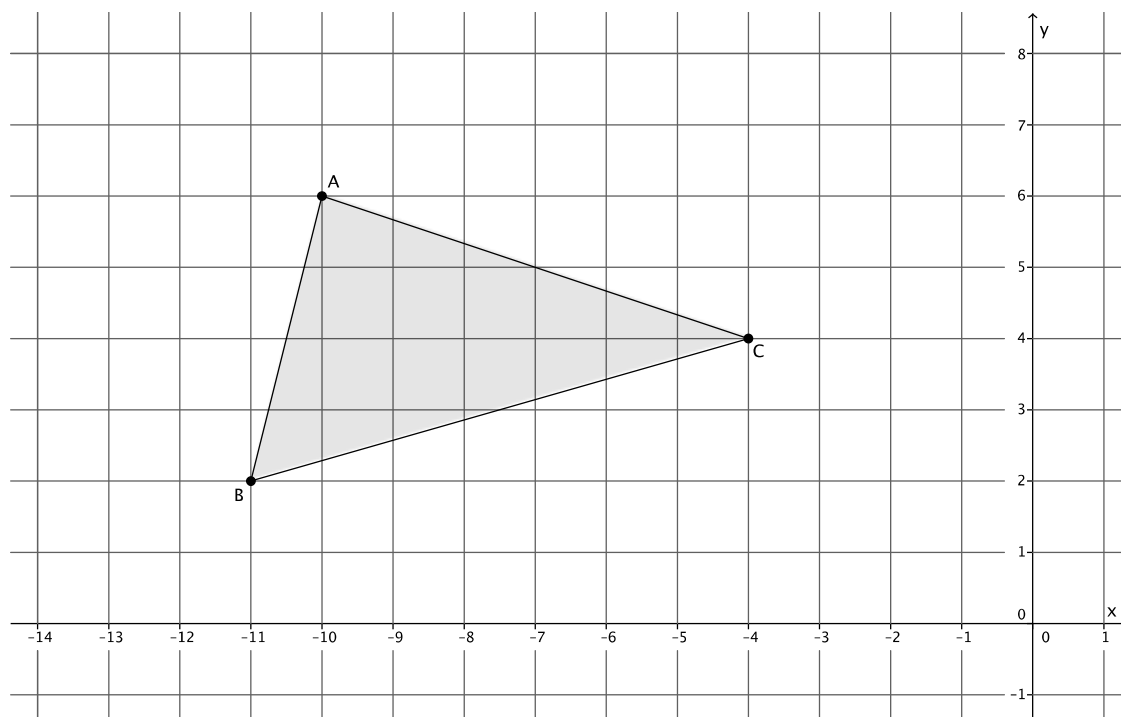
**Lesson Summary**

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  $(rx, ry)$ .

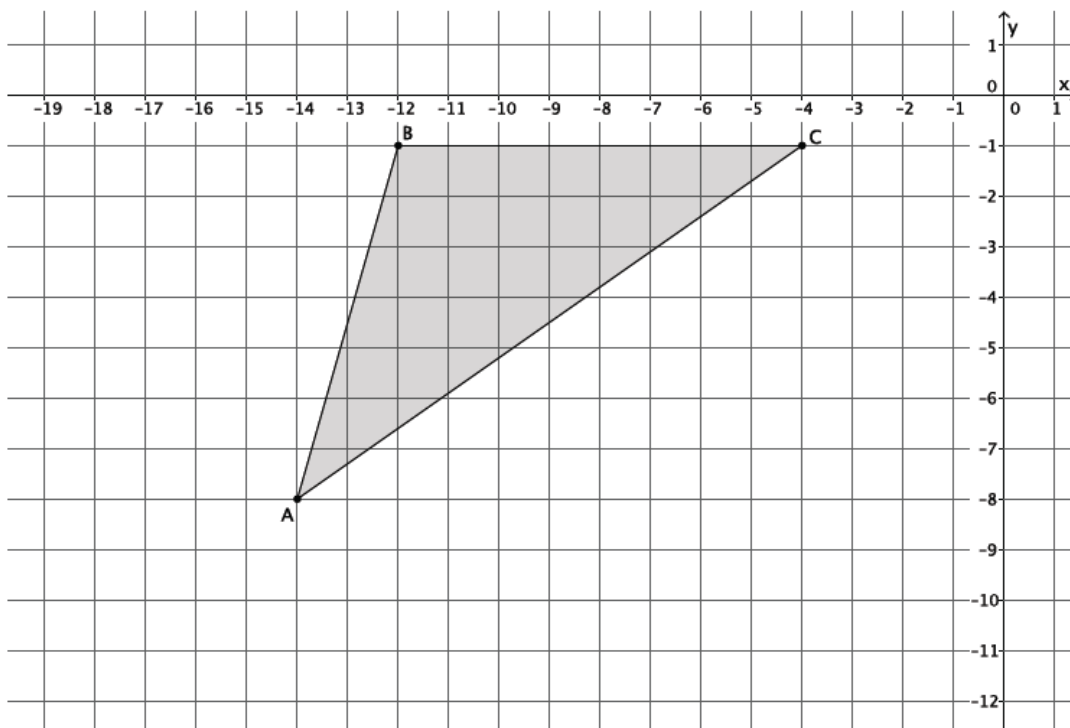
For example, if a point  $(3, -5)$  in the plane is dilated from the origin by a scale factor of  $r = 4$ , then the coordinates of the dilated point are  $(4 \cdot 3, 4 \cdot (-5)) = (12, -20)$ .

**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  $A'B'C'$ .

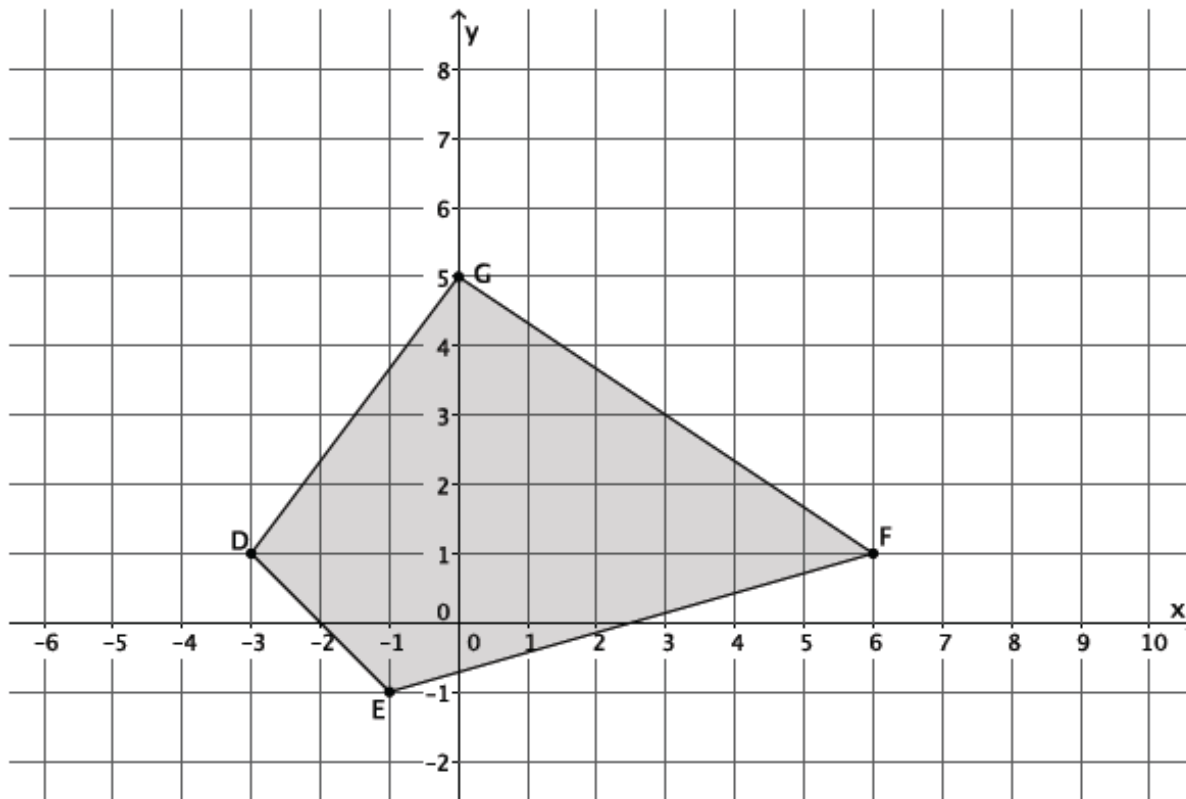


2. Triangle  $ABC$  is shown on the coordinate plane below. The triangle is dilated from the origin by scale factor  $r = \frac{5}{4}$ . Identify the coordinates of the dilated triangle  $A'B'C'$ .



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  $A'B'C'$ .

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  $D'E'F'G'$ .