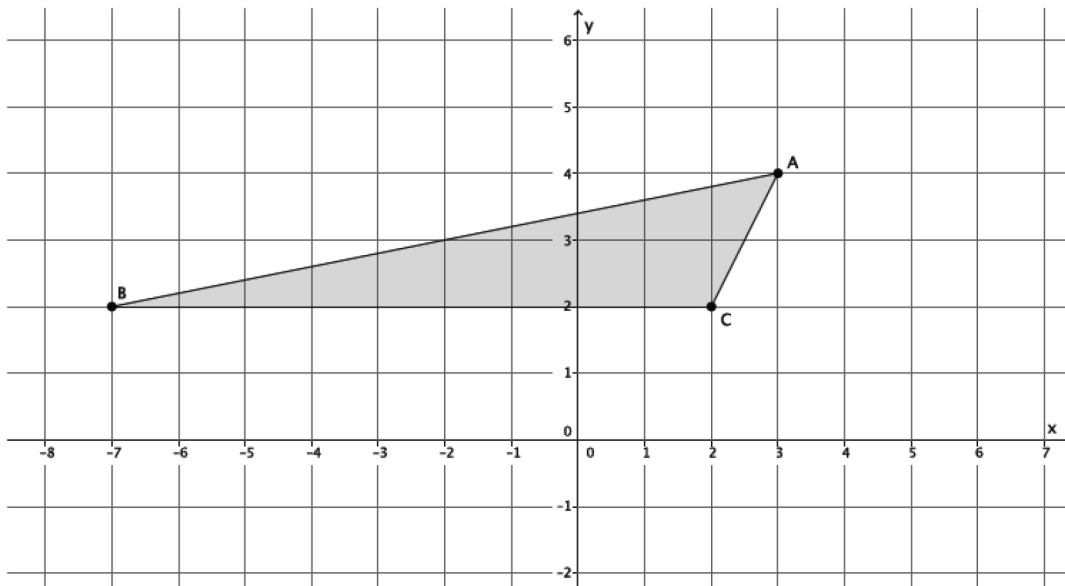Name _____   Date _____

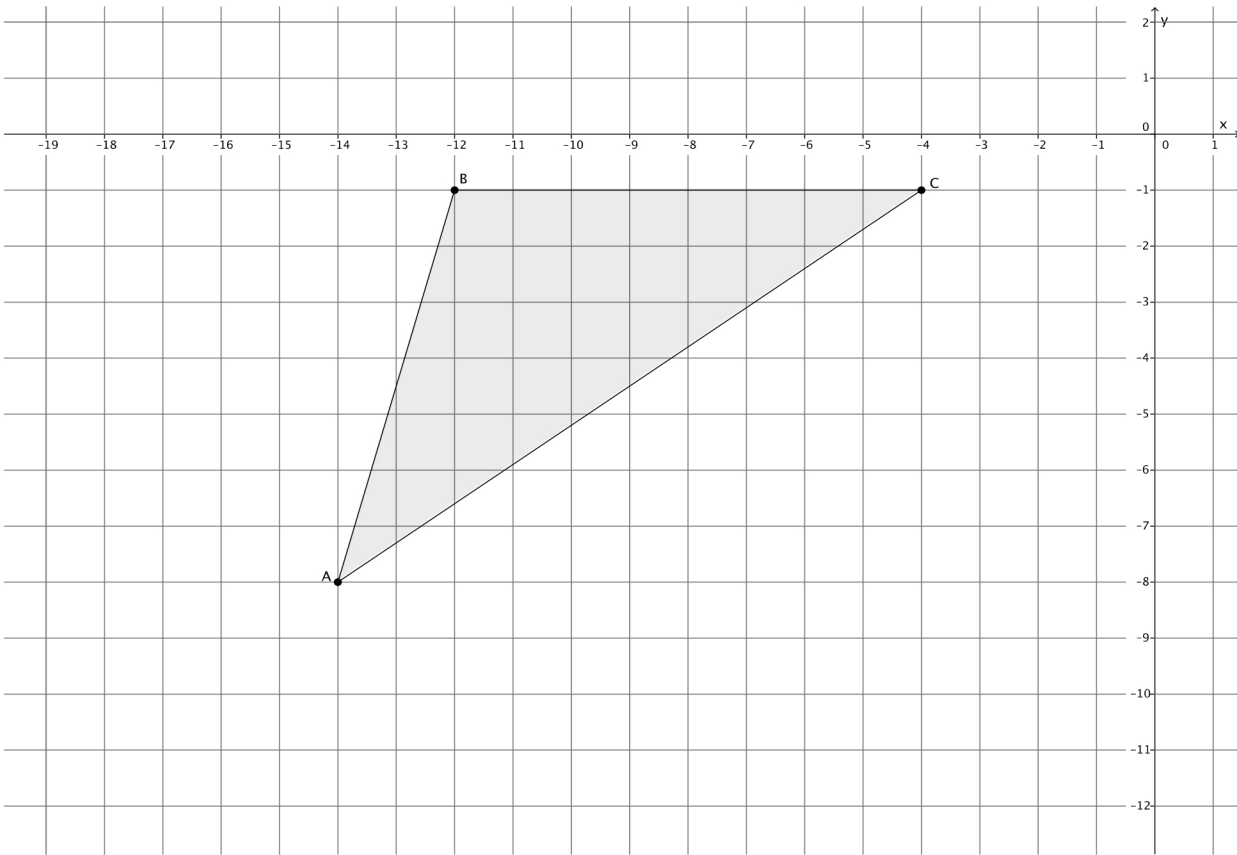# Dilations on the Coordinate Plane

1. The point $A = (7, 4)$ is dilated from the origin by a scale factor $r = 3$. What are the coordinates of A'?

2. The triangle ABC, shown on the coordinate plane below, is dilated from the origin by scale factor $r = \frac{1}{2}$. What is the location of triangle $A'B'C'$? Draw and label it on the coordinate plane.

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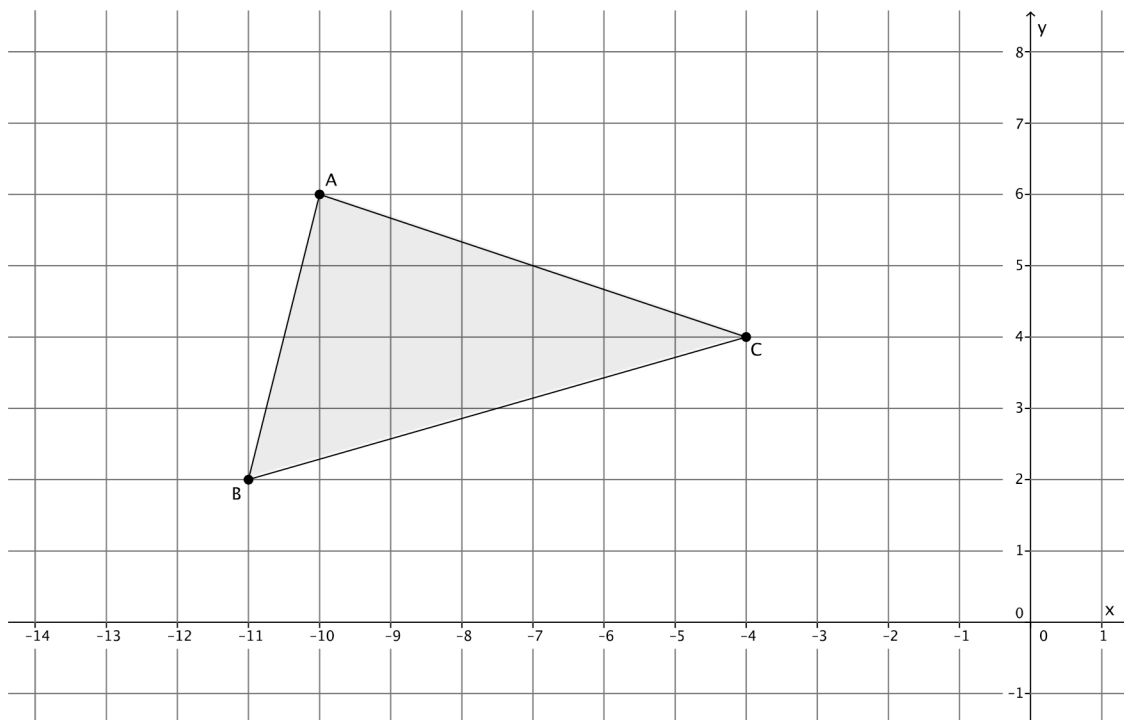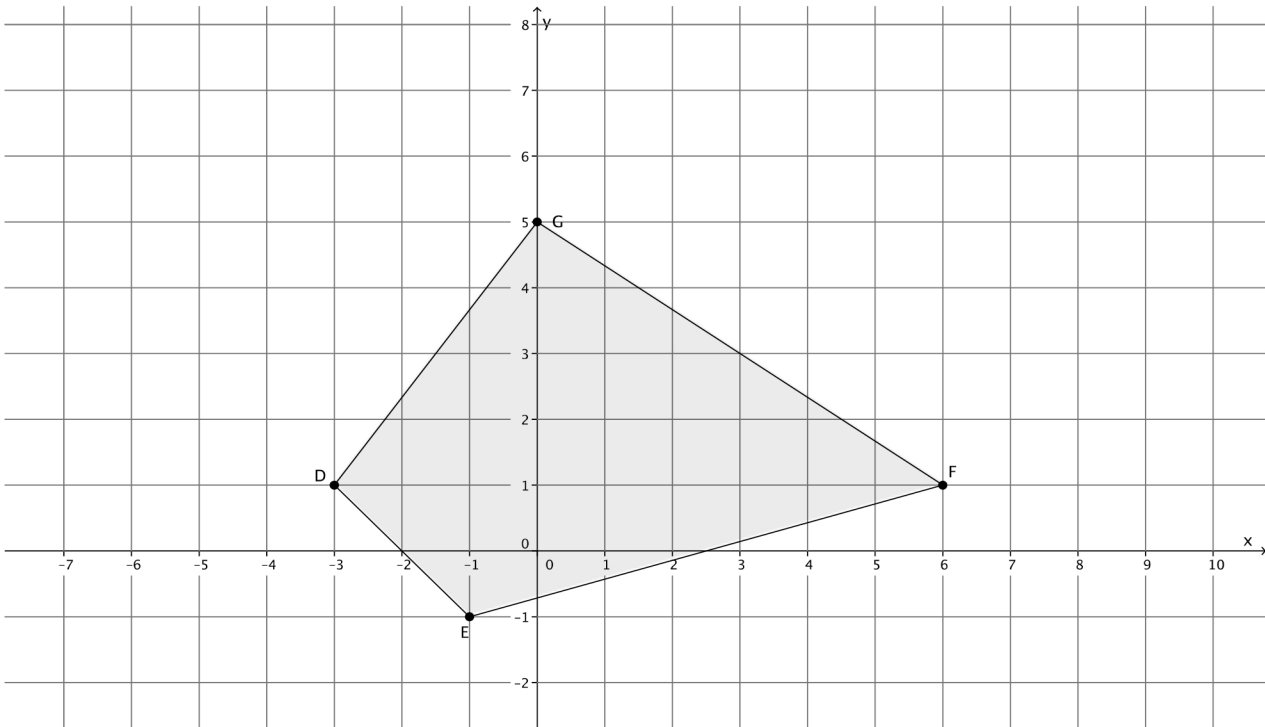
2. Triangle ABC is shown on the coordinate plane below. The triangle is dilated from the origin by scale factor $r = \frac{5}{4}$. Identify the coordinates of the dilated triangle $A'B'C'$.

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 $D'E'F'G'$.

1. The point $A = (7, 4)$ is dilated from the origin by a scale factor $r = 3$. What are the coordinates of A'?

    Since point $A = (7, 4)$, then $A' = (3 \times 7, 3 \times 4) = (21, 12)$.

2. The triangle ABC, shown on the coordinate plane below, is dilated from the origin by scale factor $r = \frac{1}{2}$. What is the location of triangle $A'B'C'$? Draw and label it on the coordinate plane.
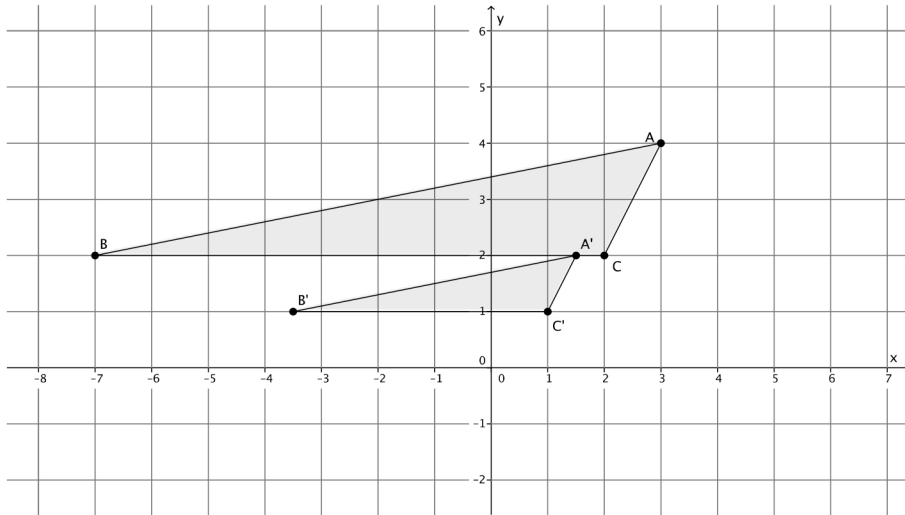
Point $A = (3, 4)$, so $A' = \left(\frac{1}{2} \times 3, \frac{1}{2} \times 4\right) = \left(\frac{3}{2}, 2\right)$.

Point $B = (-7, 2)$, so $B' = \left(\frac{1}{2} \times (-7), \frac{1}{2} \times 2\right) = \left(-\frac{7}{2}, 1\right)$.

Point $C = (2, 2)$, so $C' = \left(\frac{1}{2} \times 2, \frac{1}{2} \times 2\right) = (1, 1)$.

The coordinates of the vertices of triangle $A'B'C'$ are $\left(\frac{3}{2}, 2\right)$, $\left(-\frac{7}{2}, 1\right)$, and $(1, 1)$, respectively.

Students practice finding the coordinates of dilated points of two-dimensional figures.

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 $A'B'C'$.
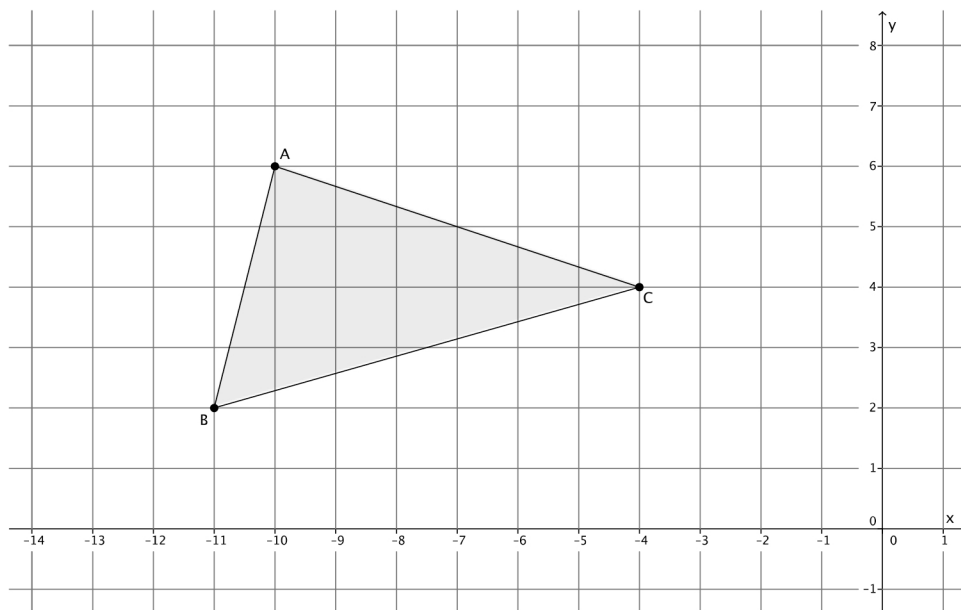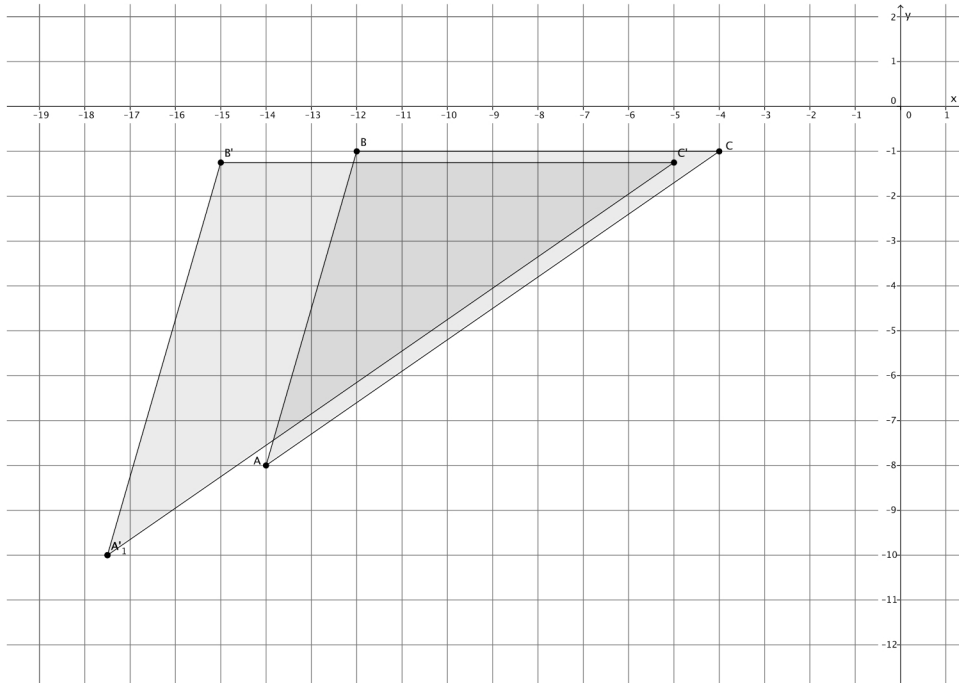

Point $A = (-10, 6)$, so $A' = (4 \times (-10), 4 \times 6) = (-40, 24)$.

Point $B = (-11, 2)$, so $B' = (4 \times (-11), 4 \times 2) = (-44, 8)$.

Point $C = (-4, 4)$, so $C' = (4 \times (-4), 4 \times 4) = (-16, 16)$.

The coordinates of the vertices of triangle $A'B'C'$ are $(-40, 24)$, $(-44, 8)$, and $(-16, 16)$, respectively.

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 $A'B'C'$.

Point $A = (-14, -8)$, so $A' = \left(\frac{5}{4} \times (-14), \frac{5}{4} \times (-8) \right) = \left(-\frac{35}{2}, -10 \right)$.

Point $B = (-12, -1)$, so $B' = \left(\frac{5}{4} \times (-12), \frac{5}{4} \times (-1) \right) = \left(-15, -\frac{5}{4} \right)$.

Point $C = (-4, -1)$, so $C' = \left(\frac{5}{4} \times (-4), \frac{5}{4} \times (-1) \right) = \left(-5, -\frac{5}{4} \right)$.

The coordinates of the vertices of triangle $A'B'C'$ are $\left(-\frac{35}{2}, -10 \right)$, $\left(-15, -\frac{5}{4} \right)$, and $\left(-5, -\frac{5}{4} \right)$, respectively.

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 $A'B'C'$.

Point $A = (6, 1)$, so $A' = \left(\frac{1}{2} \times 6, \frac{1}{2} \times 1 \right) = \left(3, \frac{1}{2} \right)$.

Point $B = (12, 4)$, so $B' = \left(\frac{1}{2} \times 12, \frac{1}{2} \times 4 \right) = (6, 2)$.

Point $C = (-6, 2)$, so $C' = \left(\frac{1}{2} \times (-6), \frac{1}{2} \times 2 \right) = (-3, 1)$.

The coordinates of the vertices of triangle $A'B'C'$ are $\left(3, \frac{1}{2} \right)$, $(6, 2)$, and $(-3, 1)$, respectively.

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.
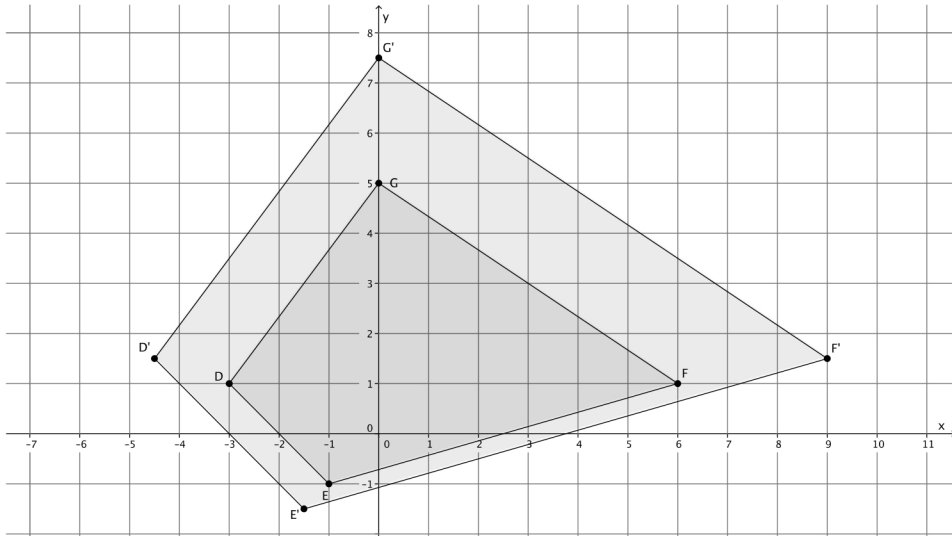
Point $D = (-3, 1)$, so $D' = \left(\frac{3}{2} \times (-3), \frac{3}{2} \times 1\right) = \left(-\frac{9}{2}, \frac{3}{2}\right)$.

Point $E = (-1, -1)$, so $E' = \left(\frac{3}{2} \times (-1), \frac{3}{2} \times (-1)\right) = \left(-\frac{3}{2}, -\frac{3}{2}\right)$.

Point $F = (6, 1)$, so $F' = \left(\frac{3}{2} \times 6, \frac{3}{2} \times 1\right) = \left(9, \frac{3}{2}\right)$.

Point $G = (0, 5)$, so $G' = \left(\frac{3}{2} \times 0, \frac{3}{2} \times 5\right) = \left(0, \frac{15}{2}\right)$.

The coordinates of the vertices of figure $D'E'F'G'$ are $\left(-\frac{9}{2}, \frac{3}{2}\right)$, $\left(-\frac{3}{2}, -\frac{3}{2}\right)$, $\left(9, \frac{3}{2}\right)$, and $\left(0, \frac{15}{2}\right)$, respectively.

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 $D'E'F'G'$.

Point $D = (1, 1)$, so $D' = (7 \times 1, 7 \times 1) = (7, 7)$.

Point $E = (7, 3)$, so $E' = (7 \times 7, 7 \times 3) = (49, 21)$.

Point $F = (5, -4)$, so $F' = \left(7 \times 5, 7 \times (-4)\right) = (35, -28)$.

Point $G = (-1, -4)$, so $G' = \left(7 \times (-1), 7 \times (-4)\right) = (-7, -28)$.

The coordinates of the vertices of figure $D'E'F'G'$ are $(7, 7)$, $(49, 21)$, $(35, -28)$, and $(-7, -28)$, respectively.