

Congruent and Similar Figures Through Dilations

Grade 8 math · Test Answer Key · Standards: 8.G.A.2, 8.G.A.3, 8.G.A.4

Award points as shown in each scoring note. Accept any valid sequence of moves in a congruence problem, and give part credit when a correct method contains one arithmetic slip that carries through consistently.

Standards: 8.G.A.2, 8.G.A.3, 8.G.A.4 · **Level:** Grade 8

Question 1 Dilate two points (2 points)

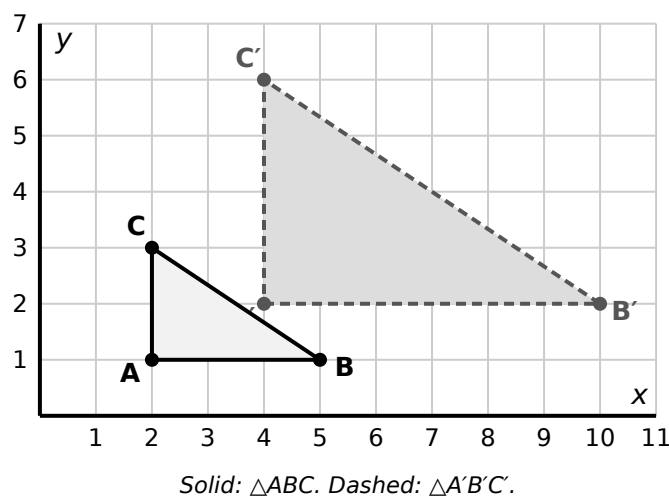
(a) $(-6 \cdot 1/3, 9 \cdot 1/3) = (-2, 3)$

(b) $(4 \cdot 3, -5 \cdot 3) = (12, -15)$

Scoring: 1 point per part.

Question 2 Dilate a triangle (3 points)

(a) $A'(4, 2)$, $B'(10, 2)$, $C'(4, 6)$.



(b) $AB = 3$ and $A'B' = 6$, so the ratio is **2 : 1**.

Scoring: part (a) 2 points for all three vertices (1 point if two are correct); part (b) 1 point.

Question 3 Recover the factor (3 points)

(a) $10 \div 4 = 2.5$ and $15 \div 6 = 2.5$. **2.5**

(b) $(-2 \cdot 2.5, 8 \cdot 2.5) = (-5, 20)$

(c) $8 \cdot 2.5 = 20$ units

Scoring: 1 point per part.

Question 4 Congruent triangles (3 points)

(a) Reflect across the x-axis: $J(2, 2) \rightarrow (2, -2)$; $K(6, 2) \rightarrow (6, -2)$; $L(2, 5) \rightarrow (2, -5)$. Translate 7 units left and 1 unit up: $(-5, -1)$, $(-1, -1)$, $(-5, -4)$.

Reflection across the x-axis, then a translation 7 left and 1 up

(b) **Yes**, because rigid motions map one onto the other.

Scoring: part (a) 1 point per correct move; part (b) 1 point.

Question 5 Similar rectangles (3 points)

(a) $9 \div 6 = 3/2$ and $12 \div 8 = 3/2$, so the sides are proportional and all angles are 90° . **Yes, with scale factor $3/2$ from Q to P**

(b) Perimeter of P: $2(9 + 12) = 42$ cm. Perimeter of Q: $2(6 + 8) = 28$ cm. $42 \div 28 = 3/2$.

Scoring: part (a) 1 point for the ratios, 1 point for the conclusion; part (b) 1 point.

Question 6 Missing side (2 points)

Scale factor: $10 \div 14 = 5/7$, and $15 \div 21 = 5/7$.

$$x = 28 \cdot 5/7 = 20.$$

$x = 20$

Scoring: 1 point for the scale factor, 1 point for the value of x .

Question 7 Dilated segment (2 points)

(a) $U' = (6, 9)$ and $V' = (-12, 3)$.

(b) $UV = \sqrt{(12^2 + 4^2)} = \sqrt{160} = 4\sqrt{10}$ and $U'V' = \sqrt{(18^2 + 6^2)} = \sqrt{360} = 6\sqrt{10}$. **$U'V'$ is $3/2$ times as long as UV** , the scale factor.

Scoring: 1 point per part.

Question 8 Toy car model (2 points)

$9 \cdot 48 = 432$ in., and $432 \div 12 = 36$.

36 ft

Scoring: 1 point for 432 in., 1 point for converting to feet.