

Dilations, Scale Factor and Similar Figures

Grade 10 – Geometry math · Test · Standards: G-SRT.A.1, G-SRT.A.2, G-SRT.A.3

Name: _____ Date: _____ Class: _____

Eight questions, 20 points, 45 minutes. Show your work and write scale factors as fractions or decimals. Figures are not drawn to scale unless coordinates are labeled.

Standards: G-SRT.A.1, G-SRT.A.2, G-SRT.A.3 · **Level:** Grade 10 Geometry

Time: 45 minutes · 8 questions · Total: 20 points · Calculator: as allowed by your teacher

Question 1 Dilate two points (2 points)

Dilate each point about the origin.

- a. $P(-3, 4)$ with scale factor 2.5 (1 point)
- b. $Q(6, -9)$ with scale factor $\frac{1}{3}$ (1 point)

Question 2 Dilate a triangle (3 points)

Triangle DEF has $D(2, 1)$, $E(5, 1)$ and $F(2, 5)$. Dilate it about the origin with scale factor 3 and give the image vertices.

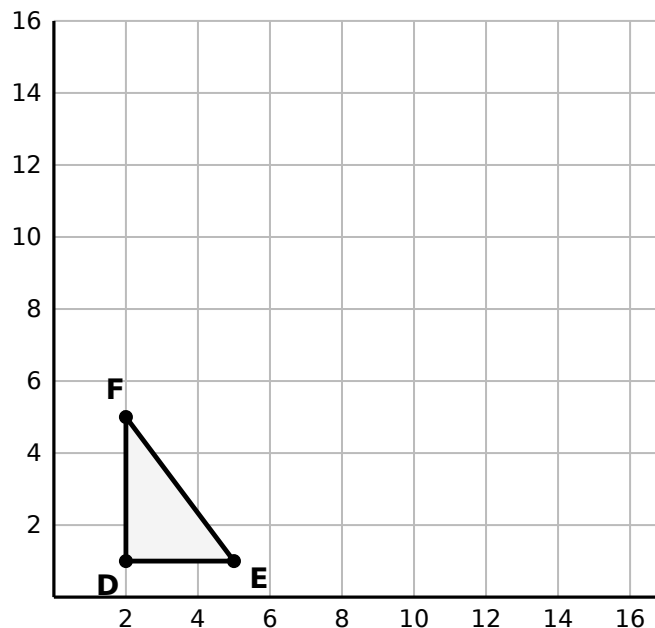


Figure for Question 2.

Question 3 Center away from the origin (2 points)

A dilation has center $(1, 2)$ and scale factor 2. Find the image of $M(4, 3)$ (1 point) and of $N(-1, 0)$ (1 point).

Question 4 Properties of dilations (3 points)

A dilation has center O and scale factor 3.

- A line ℓ does not pass through O . How is its image related to ℓ ? (1 point)
- A line m passes through O . What is the image of m ? (1 point)
- A segment is 9 units long. How long is its image? (1 point)

Question 5 Similar triangle sides (3 points)

$\triangle ABC \sim \triangle DEF$. $AB = 8$, $BC = 12$, $CA = 10$ and $DE = 20$.

- Find the scale factor from $\triangle ABC$ to $\triangle DEF$. (1 point)
- Find EF . (1 point)
- Find DF . (1 point)

Question 6 AA similarity (3 points)

$\triangle PQR$ has angles $m\angle P = 48^\circ$ and $m\angle Q = 75^\circ$. $\triangle XYZ$ has $m\angle X = 57^\circ$ and $m\angle Y = 75^\circ$.

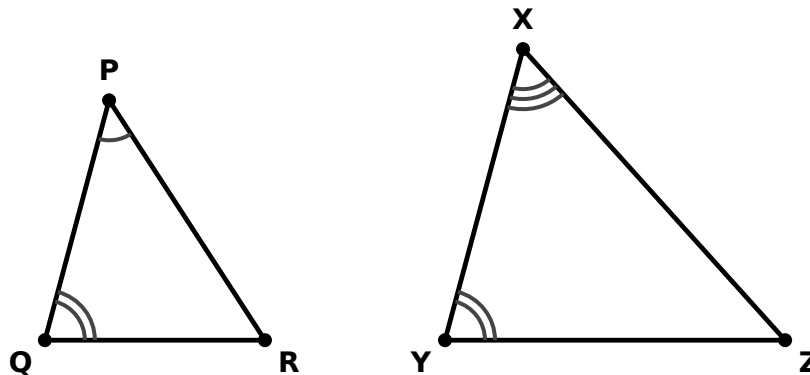


Figure for Question 6 (not drawn to scale).

- Find $m\angle R$ and $m\angle Z$. (1 point)
- Are the triangles similar? Name the criterion. (1 point)
- Write a similarity statement with matching vertices. (1 point)

Question 7 Dilation then translation (2 points)

Triangle ABC with $A(0, 0)$, $B(3, 0)$ and $C(0, 4)$ is mapped onto $A'(-2, 1)$, $B'(4, 1)$ and $C'(-2, 9)$. Find the scale factor of the dilation about the origin (*1 point*) and the translation that follows (*1 point*).

Question 8 Flagpole shadow (2 points)

A 1.5-meter stick casts a shadow of 1.2 meters. At the same time a flagpole casts a shadow of 9.6 meters. Write the ratio that relates the triangles (*1 point*) and find the height of the flagpole (*1 point*).