

Rigid Motions and Transformations: math test solutions, Grade 10 – download the PDF

Test solutions with the detailed point scale. Add up your points and spot what to review.

Suggested time: 45 minutes. Out of 20 points. Calculator allowed only when the problem says so.

1 Applying the rules

/ 4 pts

- a. $(-6 + 7, 2 - 5) = (1, -3)$ (1 pt)
- b. $(6, 2)$ (1 pt)
- c. $(-6, -2)$ (1 pt)
- d. $(-y, x) = (-2, -6)$ (1 pt)

2 A half turn

/ 3 pts

- a. $(x, y) \rightarrow (-x, -y)$: $K'(-1, -1)$, $L'(-4, -1)$, $M'(-1, -3)$. (1.5 pts)
- b. $LM^2 = 3^2 + 2^2 = 13$ and $L'M'^2 = 3^2 + 2^2 = 13$, so $LM = L'M' = \sqrt{13}$. (1.5 pts)

3 Composition

/ 4 pts

- a. $T: (2, 2)$; then $R: (2, -2)$. (1.5 pts)
- b. $R: (3, 2)$; then $T: (2, 6)$. (1.5 pts)
- c. No, $(2, -2) \neq (2, 6)$: the order of a composition matters. (1 pt)

4 Identify the rotation

/ 3 pts

- a. $A(1, 2) \rightarrow (-2, 1)$ matches $(x, y) \rightarrow (-y, x)$: a 90° counterclockwise rotation. (1 pt)
- b. $B(4, 2) \rightarrow (-2, 4)$ and $C(1, 5) \rightarrow (-5, 1)$, as given. (1 pt)
- c. 270° clockwise. (1 pt)

5 Symmetry

/ 3 pts

- a. 9 lines (1 pt); $360^\circ \div 9 = 40^\circ$ (1 pt).
- b. 2 lines and 180° (1 pt).

6 Congruent triangles

/ 3 pts

- a. $AB = 3, AC = 4, BC = 5; GH = 3, GI = 4, HI = \sqrt{16 + 9} = 5$. The sides match (SSS). (1.5 pts)
- b. Translate by $\langle 2, 2 \rangle$: $A \rightarrow G, B \rightarrow (5, 2), C \rightarrow (2, 6)$. Then rotate 90° counterclockwise about $G(2, 2)$: $B \rightarrow (2, 5) = H$ and $C \rightarrow (-2, 2) = I$. (1.5 pts)



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