

Circle the letter corresponding to the *best* answer.

Question 1. Which type of isometry has a fixed point?

- (A) reflection
- (B) rotation
- (C) translation
- (D) reflection and rotation
- (E) reflection, rotation, and translation

Question 2. The composition of two reflections is a

- (A) reflection
- (B) rotation
- (C) translation
- (D) glide reflection
- (E) depends on the reflections

Question 3. Which is *not* true of all vectors.

- (A) A vector has direction.
- (B) A vector has magnitude.
- (C) A vector has position.
- (D) A vector in a coordinate plane has components.
- (E) A vector determines a unique translation.

Question 4. If $A = (4, 3)$ is rotated by 90° about the point $Q = (1, 5)$, the result is

- (A) $(1, 5)$
- (B) $(4, 3)$
- (C) $(5, 8)$
- (D) $(3, -2)$
- (E) $(3, 8)$

Question 5. Let $A = (4, 3)$, $\vec{v} = \langle 2, -2 \rangle$, and $\vec{w} = \langle 5, 6 \rangle$. Let R be translation by \vec{v} , and let S be translation by \vec{w} . What is $S(R(A))$?

- (A) $(6, 1)$
- (B) $(7, 4)$
- (C) $(9, 9)$
- (D) $(11, 7)$
- (E) $(12, 6)$