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Written Solution

Honors Geometry | Date: 2026-01-10

Problem. Triangle ABC has $A(-2,1)$, $B(1,4)$, and $C(4,-1)$. Apply the composite transformation T defined by:

1. Reflect across the x-axis: $(x,y) \to (x,-y)$
2. Apply an anisotropic dilation: $(x,y) \to \left(2x, \frac{1}{2}y\right)$
3. Translate by vector $\langle -3, 2 \rangle$: $(x,y) \to (x-3, y+2)$

Solution

We apply the transformations sequentially to each vertex of the triangle.

1. Path of Point A: $(-2,1)$

- Reflect $(y \to -y)$: $\quad (-2,1) \to (-2,-1)$
- Dilate $(2x, 0.5y)$: $\quad (-2,-1) \to (-4,-0.5)$
- Translate $(-3,+2)$: $\quad (-4,-0.5) \to (-4-3, -0.5+2) = (\mathbf{-7}, \mathbf{1.5})$

2. Path of Point B: $(1,4)$

- Reflect $(y \to -y)$: $\quad (1,4) \to (1,-4)$
- Dilate $(2x, 0.5y)$: $\quad (1,-4) \to (2,-2)$
- Translate $(-3,+2)$: $\quad (2,-2) \to (2-3, -2+2) = (\mathbf{-1}, \mathbf{0})$

3. Path of Point C: $(4,-1)$

- Reflect $(y \to -y)$: $\quad (4,-1) \to (4,1)$
- Dilate $(2x, 0.5y)$: $\quad (4,1) \to (8,0.5)$
- Translate $(-3,+2)$: $\quad (8,0.5) \to (8-3, 0.5+2) = (\mathbf{5}, \mathbf{2.5})$

Final Answer

The orientation is **reversed** due to the single reflection across the x-axis. The exact area scale factor is **1**, calculated from the product of the anisotropic dilation factors $(2 \cdot \frac{1}{2} = 1)$, meaning the area is preserved.

The coordinates of the transformed triangle $A'B'C'$ are:

$$\boxed{A'(-7,1.5), \quad B'(-1,0), \quad C'(5,2.5)}$$

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