Exercise 5

Find the area of the parallelogram with sides **a** and **b** given in Exercise 3.

Solution

The vectors from Exercise 3 are

$$\mathbf{a} = (1, -2, 1)$$
$$\mathbf{b} = (2, 1, 1),$$

and its cross product was found to be $\mathbf{a} \times \mathbf{b} = (-3, 1, 5)$. The area of the parallelogram is the magnitude of this cross product.

$$A = \|\mathbf{a} \times \mathbf{b}\| = \sqrt{(-3)^2 + 1^2 + 5^2} = \sqrt{35}$$