Exercise 48

In Exercises 47–62, say whether the function is even, odd, or neither. Give reasons for your answer.

$$f(x) = x^{-5}$$

Solution

The function is odd because

$$f(-x) = (-x)^{-5}$$

$$= \frac{1}{(-x)^5}$$

$$= \frac{1}{(-1)^5 x^5}$$

$$= \frac{1}{-x^5}$$

$$= -\frac{1}{x^5}$$

$$= -x^{-5}$$

$$= -f(x).$$

This is reflected in the graph by the symmetry about the origin.