Exercise 16

For the following exercises, determine whether the functions are even, odd, or neither.

$$f(x) = -\frac{5}{x^3} + 9x^5$$

Solution

Plug $-x$ into the function.

$$\begin{aligned} f(-x) &= -\frac{5}{(-x)^3} + 9(-x)^5 \\ &= -\frac{5}{(-1)^3 x^3} + 9(-1)^5 x^5 \\ &= -\frac{5}{(-1)x^3} + 9(-1)x^5 \\ &= \frac{5}{x^3} - 9x^5 \\ &= -\left(-\frac{5}{x^3} + 9x^5\right) \\ &= -f(x) \end{aligned}$$

Since $f(-x) = -f(x)$, the function is odd.