Exercise 48

For the following exercises, make a table to confirm the end behavior of the function.

$$f(x) = x^2(1-x)^2$$

Solution

Plug in several values of x into the function and see what the corresponding values of y are.

x	y
-3	144
-2	36
-1	4
0	0
1	0
2	4
3	36
4	144

The leading term has $x^2(x)^2 = x^4$, a variable raised to an even power, and its coefficient $(1 \cdot (-1)^2 = 1)$ is positive, so $f(x) \to \infty$ as $x \to \pm\infty$. Expanding the function confirms this.

$$f(x) = x^2 - 2x^3 + x^4$$