Exercise 49

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

$$f(x) = (x - 1)(x - 2)(3 - x)$$

Solution

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

x	y
-3	120
-2	60
-1	24
0	6
1	0
2	0
3	0
4	-6
5	-24
6	-60
7	-120

The leading term has $(x)(x)(x) = x^3$, a variable raised to an odd power, and its coefficient $((1)(1)(-1) = -1)$ is negative, so $f(x) \to \infty$ as $x \to -\infty$ and $f(x) \to -\infty$ as $x \to \infty$. Expanding the function confirms this.

$$f(x) = 6 - 11x + 6x^2 - x^3$$