

## Homework – Polynomial End Behavior

Fill in the blanks for the End Behavior for each of the following functions by looking at the degree & leading coefficient of each polynomial.

1.  $f(x) = x^3 - 5x$

EVEN or ODD

POSITIVE or NEGATIVE leading coefficient

As  $x \rightarrow -\infty, f(x) \rightarrow \underline{-\infty}$

As  $x \rightarrow +\infty, f(x) \rightarrow \underline{\infty}$

6.  $f(x) = -x^5 - 3x^3 + 2$

EVEN or ODD

POSITIVE or NEGATIVE leading coefficient

As  $x \rightarrow -\infty, f(x) \rightarrow \underline{\infty}$

As  $x \rightarrow +\infty, f(x) \rightarrow \underline{-\infty}$

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

EVEN or ODD

POSITIVE or NEGATIVE leading coefficient

As  $x \rightarrow -\infty, f(x) \rightarrow \underline{\infty}$

As  $x \rightarrow +\infty, f(x) \rightarrow \underline{\infty}$

7.  $f(x) = x + 12$

EVEN or ODD

POSITIVE or NEGATIVE leading coefficient

As  $x \rightarrow -\infty, f(x) \rightarrow \underline{-\infty}$

As  $x \rightarrow +\infty, f(x) \rightarrow \underline{\infty}$

3.  $f(x) = -x^2 + 3x + 1$

EVEN or ODD

POSITIVE or NEGATIVE leading coefficient

As  $x \rightarrow -\infty, f(x) \rightarrow \underline{-\infty}$

As  $x \rightarrow +\infty, f(x) \rightarrow \underline{-\infty}$

8.  $f(x) = -x^8 + 9x^5 - 2x^4$

EVEN or ODD

POSITIVE or NEGATIVE leading coefficient

As  $x \rightarrow -\infty, f(x) \rightarrow \underline{-\infty}$

As  $x \rightarrow +\infty, f(x) \rightarrow \underline{-\infty}$

4.  $f(x) = 4x^6 - 3x^2 + 5x - 2$

EVEN or ODD

POSITIVE or NEGATIVE leading coefficient

As  $x \rightarrow -\infty, f(x) \rightarrow \underline{\infty}$

As  $x \rightarrow +\infty, f(x) \rightarrow \underline{\infty}$

9.  $f(x) = -2x^3 + 5x^2$

EVEN or ODD

POSITIVE or NEGATIVE leading coefficient

As  $x \rightarrow -\infty, f(x) \rightarrow \underline{\infty}$

As  $x \rightarrow +\infty, f(x) \rightarrow \underline{-\infty}$

5.  $f(x) = -x^4 + 1$

EVEN or ODD

POSITIVE or NEGATIVE leading coefficient

As  $x \rightarrow -\infty, f(x) \rightarrow \underline{-\infty}$

As  $x \rightarrow +\infty, f(x) \rightarrow \underline{-\infty}$

10.  $f(x) = 6x^3 + 1$

EVEN or ODD

POSITIVE or NEGATIVE leading coefficient

As  $x \rightarrow -\infty, f(x) \rightarrow \underline{-\infty}$

As  $x \rightarrow +\infty, f(x) \rightarrow \underline{\infty}$