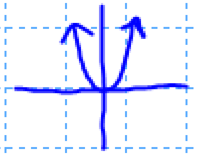
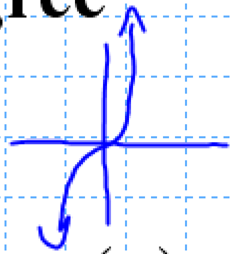
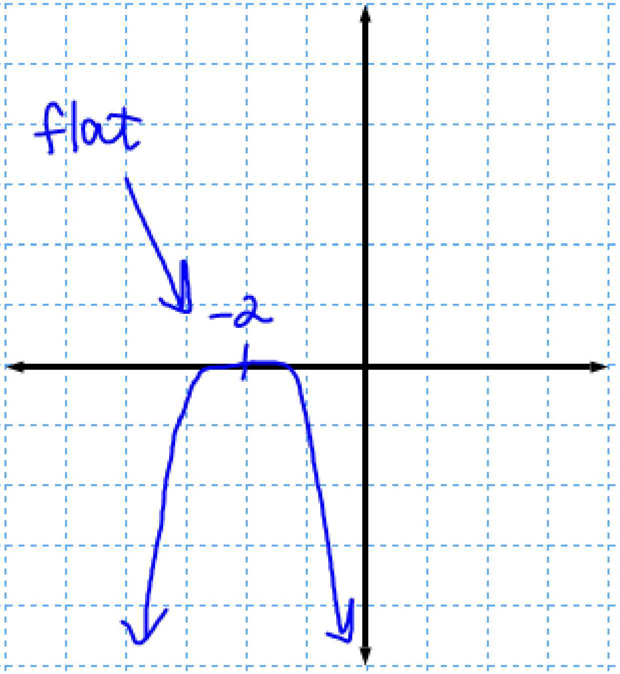
2.2(a) Polynomial Functions of Higher Degree

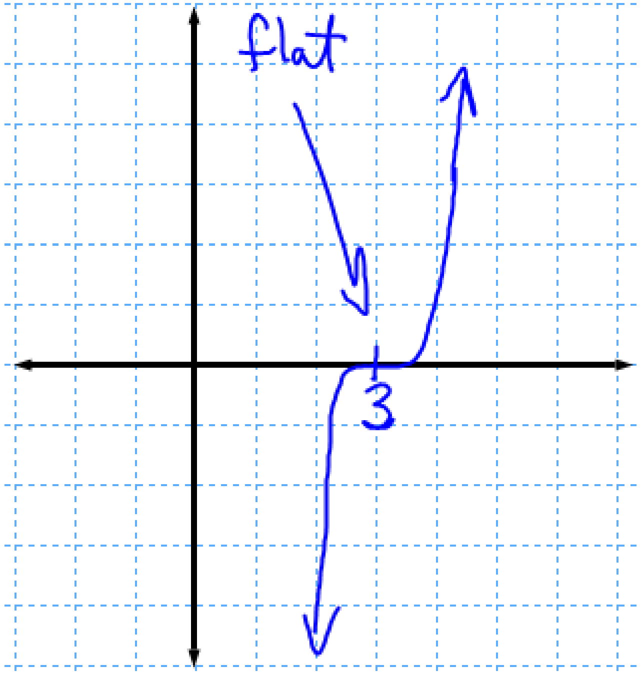
$y = x^2$ 

$y = x^3$ 

Ex. 1: Sketch $f(x) = -(x+2)^4$



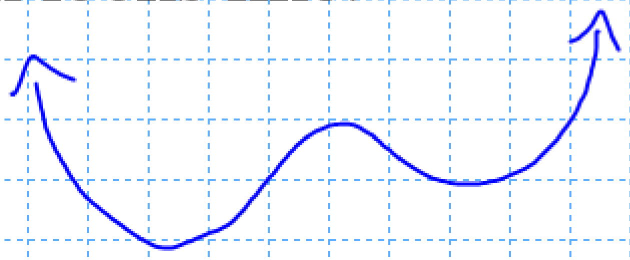
Ex. 2: Sketch $f(x) = (x-3)^5$



We can analyze a graph by using the <u>Leading Coefficient Test</u>, which determines the <u>end</u> behavior of a graph.

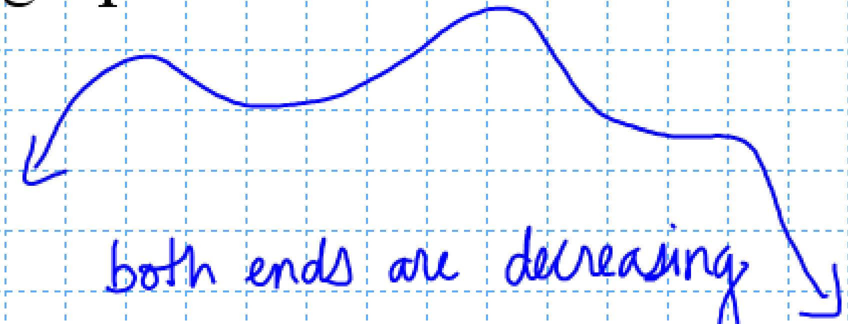
For $f(x) = \underline{ax^n} + \ldots\ldots$, if the exponent is even and:

1) the coefficient of the leading term is positive, the graph looks like:



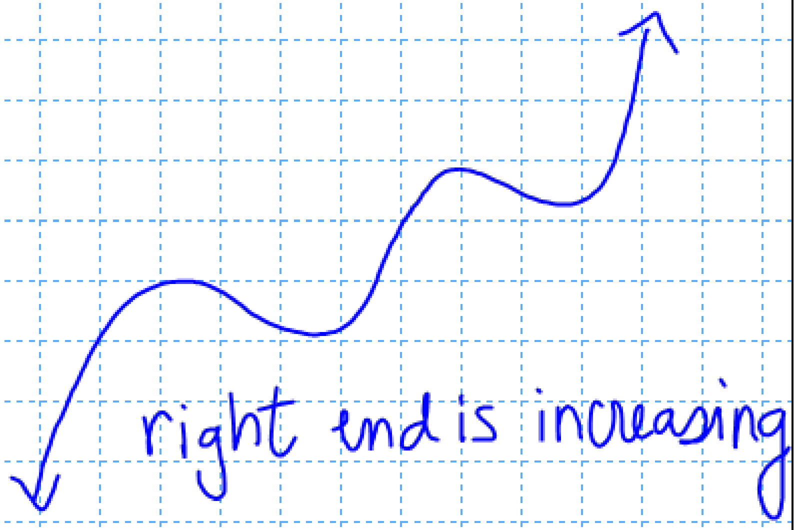
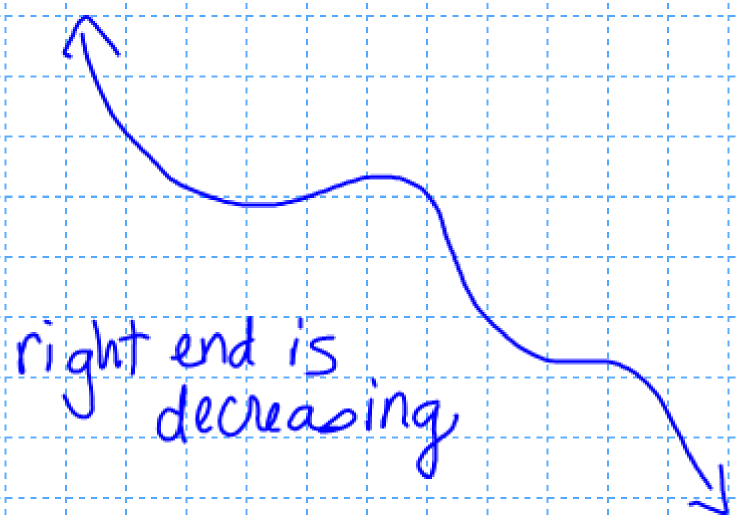
both ends are increasing

2) the coefficient of the leading term is negative, the graph looks like:



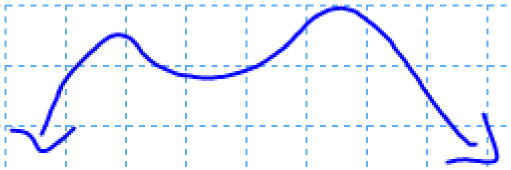
both ends are decreasing

For $f(x) = ax^n + \ldots\ldots$, if the exponent is odd and:

1) the coefficient of the leading term is positive, the graph looks like:	2) the coefficient of the leading term is negative, the graph looks like:
	

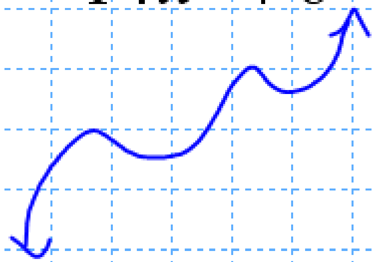
Ex.: Describe the right-hand and left-hand behavior of the graph of each function.

$$f(x) = -x^4 + 7x^3 - 14x - 9$$



both ends are decreasing

$$f(x) = 5x^5 + 2x^3 - 14x^2 + 6$$



right end is increasing

left end is decreasing