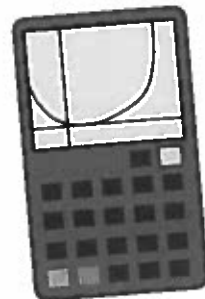


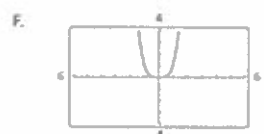
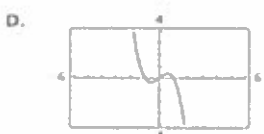
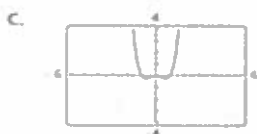
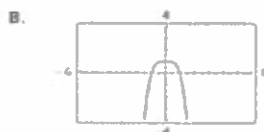
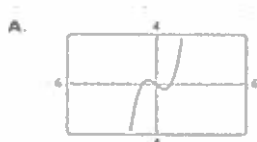
Section 4.1: Graphing Polynomial Functions



SWBAT: identify polynomial functions & graph polynomial functions using tables & end behavior

- The end behavior of a function is the behavior of the graph as x approaches positive infinity or negative infinity.
- The degree of a function is the exponent of the first term; it helps determine the end behavior.
- The leading coefficient is the number prior to the leading term, for example in the term $2x^2$ the leading coefficient is 2.

Exercise 1: Match each polynomial function with its graph



- $f(x) = x^3 - x$
- $f(x) = -x^3 + x$
- $f(x) = -x^4 + 1$
- $f(x) = x^4$
- $f(x) = x^3$
- $f(x) = x^4 - x^2$

Exercise 2: Decide whether or not each function is a polynomial function. If so, write the degree, type, and leading coefficient.

a. $f(x) = -2x^3 + 5x + 8$

b. $g(x) = -0.8x^3 + \sqrt{2x^4} - 12$

c. $h(x) = -x^2 + 7x^{-1} + 4x$

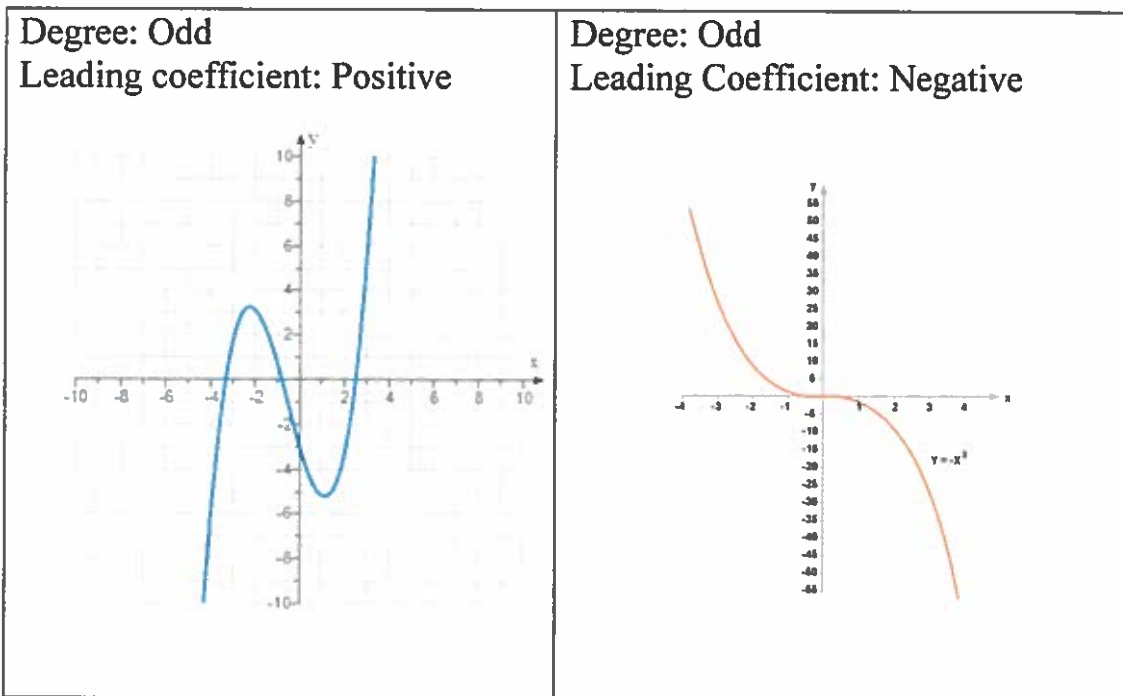
d. $k(x) = x^2 + 3^x$

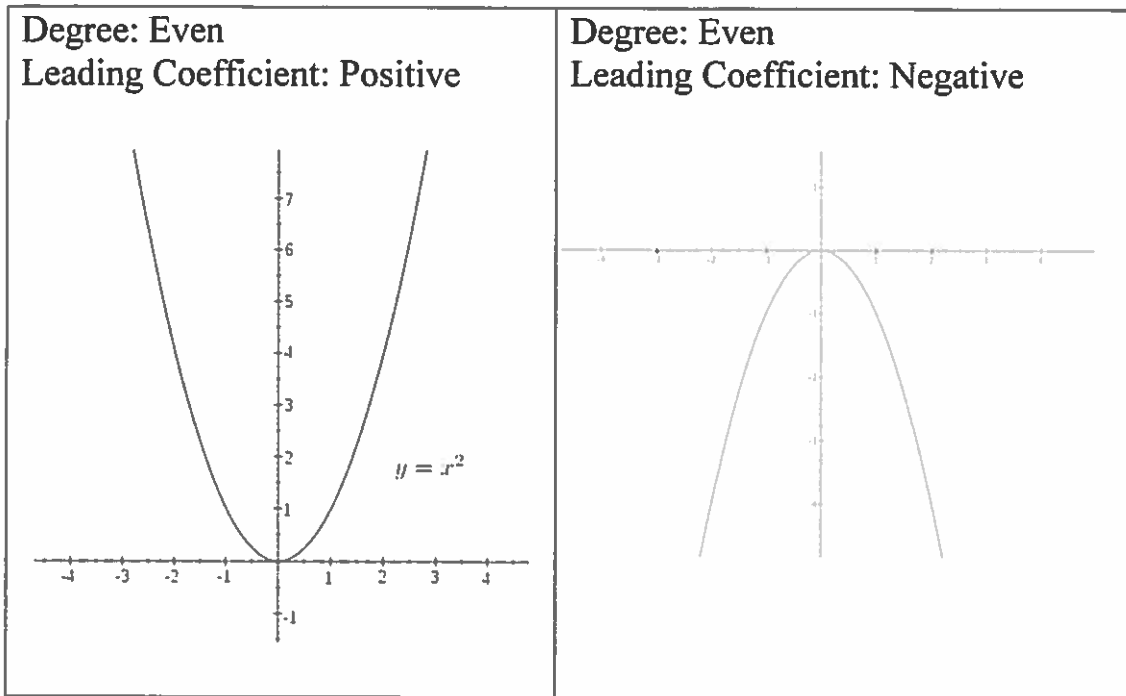
Exercise 3: Describe the end behavior of the following functions

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

b. $f(x) = 3x^5 - x^4 - 6x + 10$

c. $f(x) = 0.25x^3 - x^2 + 10$





Exercise 4: Evaluate the function for the given value of x.

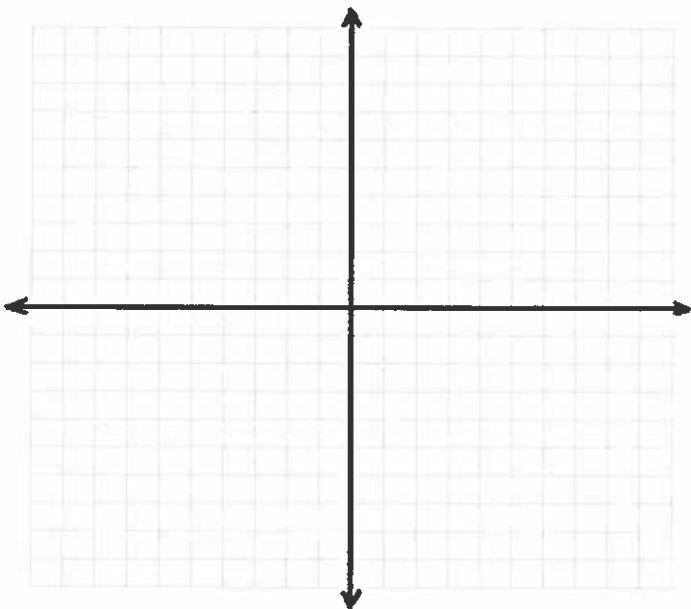
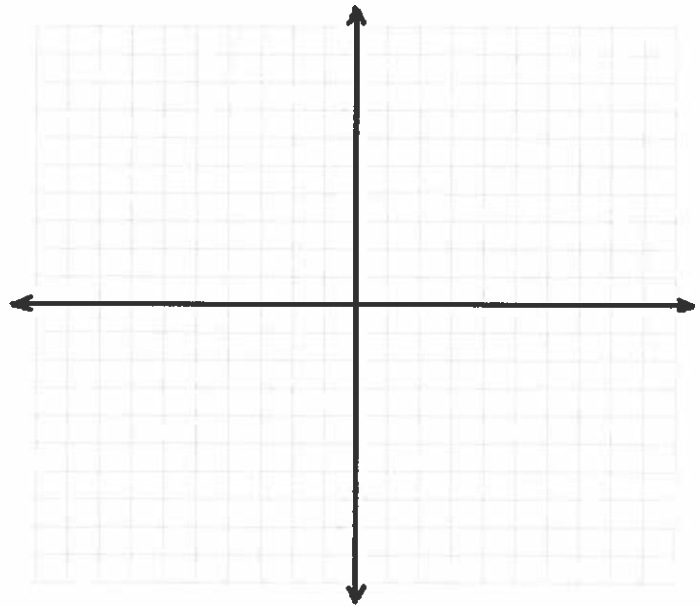
a. $f(x) = -x^3 + 3x^2 + 9, x = 4$

b. $f(x) = 3x^5 - x^4 - 6x + 10, x = -2$

c. $f(x) = 0.25x^3 - x^2 - 1, x = 4$

Exercise 4: Graph the function $f(x) = -x^3 + x^2 + 3x - 3$

x	-3	-2	-1	0	1	2	3
$f(x)$							



Exercise 5: Sketch the graph of the polynomial function that

- f is increasing when $x < 0$ and $x > 4$
- f is decreasing when $0 < x < 4$
- $f(x) > 0$ when $-2 < x < 3$ and $x > 5$
- $f(x) < 0$ when $x < -2$ and $3 < x < 5$

Exercise 6: The estimated number V (in thousands) of electric vehicles used in the United States can be modeled by the function:

$$V(t) = 0.151280t^3 + 23.7565t - 2.041$$

- a. Graph the function for the interval $1 \leq t \leq 10$, and describe the behavior of the function over this interval.

- b. What was the average rate of change from 2001 to 2010?

Mixed Review:

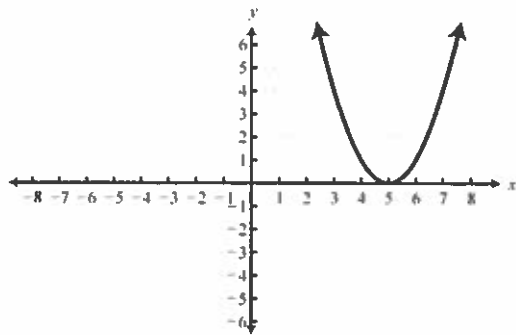
1. Write the following function in standard form, give its degree, type, and leading coefficient: $f(x) = -3x + 5x^3 - 6x^2 + 2$

2. Evaluate the function for the given value of x : $g(x) = -x^3 + 3x^2 + 5x + 1, x = -12$

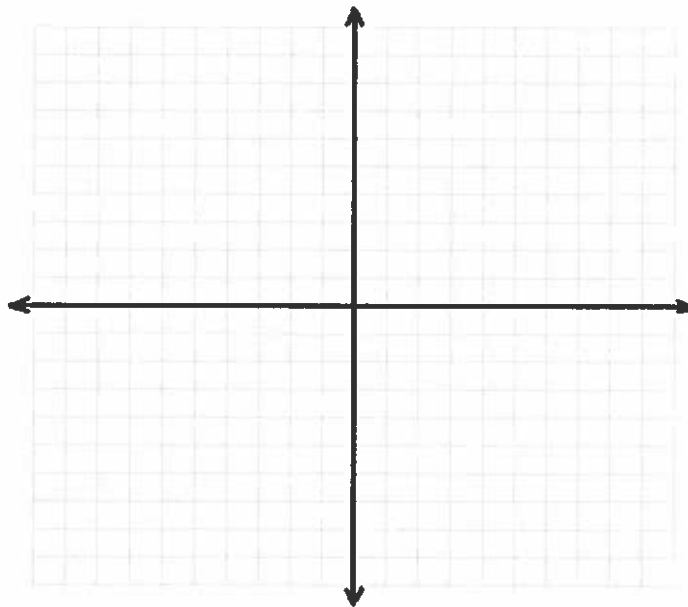
3. Describe the end behavior of the function: $h(x) = -5x^4 + 7x^3 - 6x^2 - 2x + 2$.

4. For the graph, describe the x - values for which f is increasing and decreasing, also when $f(x) > 0$ and $f(x) < 0$

4. For the graph, describe the x - values for which f is increasing and decreasing, also when $f(x) > 0$ and $f(x) < 0$



5. Graph the following function: $p(x) = x^3 + x + 3$



6. Graph the function $d(t) = -0.141t^3 + 9.64t^2 - 232.5t + 2421$ over the interval $0 \leq t \leq 27$ in your calculator. Describe the behavior of the graph for this interval.