

Show all work and simplify all answers before circling/boxing them. If you do the problem incorrectly, or don't show sufficient work, you will be asked to rewrite the problem for full credit.

**Due next class.** Students who turn assignments in late (or do not attempt a problem) forfeit their ability to rewrite those problems for credit.

- (1) Determine if the function is a polynomial. If it is, state its degree, leading term, and leading coefficient:

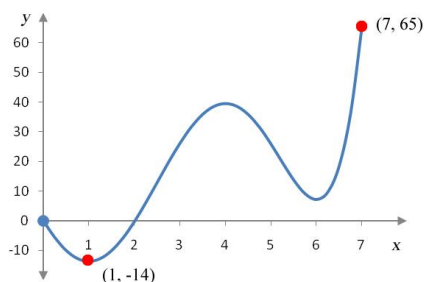
(a)  $f(x) = 2x^2 - x + 5$

(c)  $f(x) = \sqrt{x}$

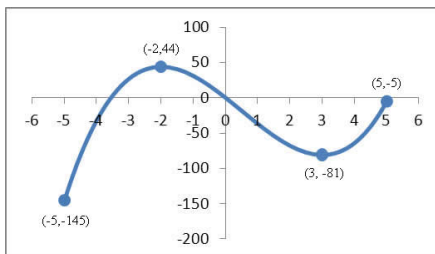
(b)  $f(x) = 1 - x^4$

(d)  $f(x) = \frac{1}{x^2 + 3x - 1}$

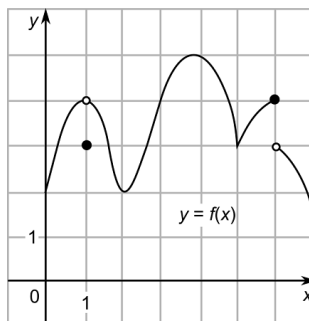
- (2) Use the graph of  $f$  to find any local extrema and absolute extrema:



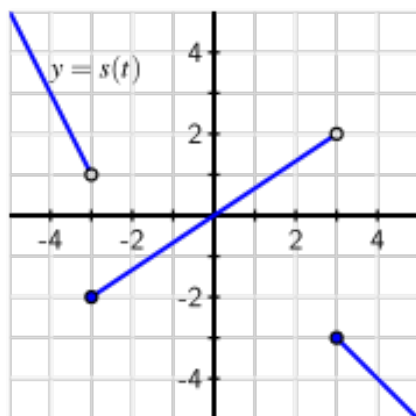
- (3) Use the graph of  $f$  to find any local extrema and absolute extrema:



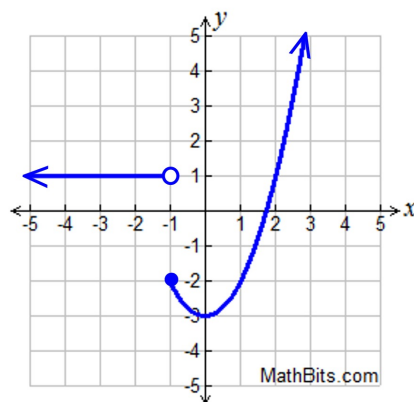
- (4) Use the graph of  $f$  to find any local extrema and absolute extrema:



- (5) Determine if the function is odd, even, or neither:  $f(x) = x^4 - 6x^2 + 2$
- (6) Determine if the function is odd, even, or neither:  $f(x) = \frac{1}{1+x^2}$
- (7) Determine if the function is odd, even, or neither:  $f(x) = \frac{x}{x^2+1}$
- (8) Find the domain and range of the following graphs:



(a)



(b)

- (9) Graph the following piecewise function:  $f(x) = \begin{cases} x + 1 & \text{if } x < 0 \\ 2 & \text{if } 0 \leq x < 3 \\ x - 3 & \text{if } x \geq 3 \end{cases}$

- (10) Find  $f(-1)$ ,  $f(2)$ , and  $f(3)$  for the following piecewise function:  $f(x) = \begin{cases} x + 1 & \text{if } x < 0 \\ 2 & \text{if } 0 \leq x < 3 \\ x - 3 & \text{if } x \geq 3 \end{cases}$