

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:

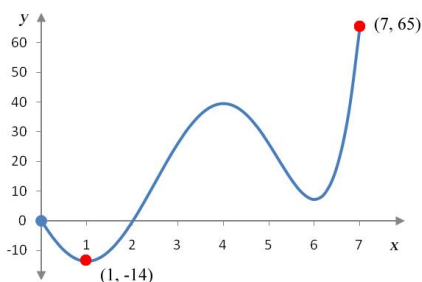
(a) $f(x) = 2x^2 - x + 5$

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

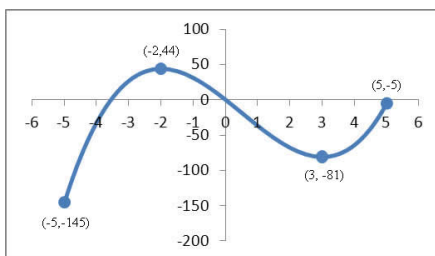
(b) $f(x) = 1 - x^4$

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

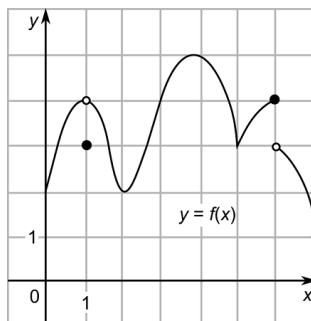
- (2) Use the graph of f to find any local extrema and absolute extrema:



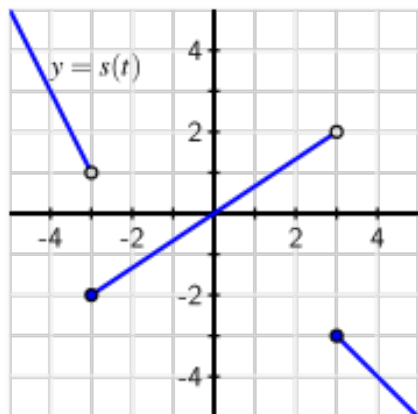
- (3) Use the graph of f to find any local extrema and absolute extrema:



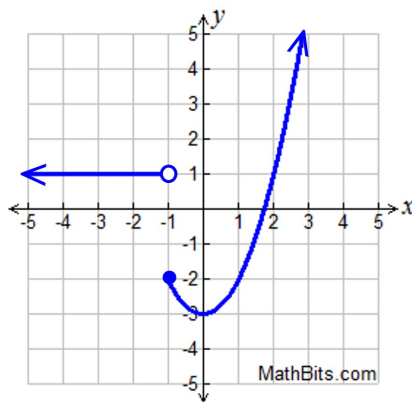
- (4) Use the graph of f to find any local extrema and absolute extrema:



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