

For the following functions:

- a. Find $f'(x) =$
- b. List intervals where the function is increasing/decreasing
- c. List the local minimum(s) and maximum(s) of the function
- d. Find $f''(x) =$
- e. List intervals where the function is concave up/concave down.
- f. Find points of inflection.
- g. Calculate the y-intercept and other points. Find the x-intercepts if you can.
- h. Now graph the function.

1. $f(x) = 12x - x^3$

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

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

4. $f(x) = x^3 + 3x$

5. $f(x) = \frac{1}{6}x^4 - \frac{1}{3}x^3$

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