

# COMPREHENSIVE CURVE SKETCHING

(o) Domain: These are the  $x$ -values for which the function  $f$  is defined.

(i) Critical Points: These are the points in the domain of  $f$  at which  $f'(x) = 0$  or  $f'(x)$  d.n.e

(ii) Increasing/Decreasing intervals:

Perform a sign test for  $f'(x)$  to find out on what intervals  $f'(x)$  is positive or negative.

(iii) Local Max/Local Min:

Look at the sign diagram in part (ii) and use the First Derivative Test.

(iv) Concavity and Points of Inflection

First find hypercritical points - pts in the domain of  $f$  at which  $f''(x) = 0$  or  $f''(x)$  d.n.e. Then perform a sign test for  $f''(x)$  to find out on what intervals  $f''(x)$  is positive or negative. etc

(v) Horizontal/vertical Asymptotes.

H.A's will tell you the behavior of the function  $f$  far away to the left (i.e.  $\lim_{x \rightarrow -\infty} f(x)$ ) or far away to the right (i.e.  $\lim_{x \rightarrow +\infty} f(x)$ ).

(vi) X and Y-intercepts