

## **GUIDELINES FOR SKETCHING CURVES**

1. Consider the domain of the function, and note any restrictions.
2. Find the  $y$ -intercept (if it exists) and any  $x$ -intercept(s), if not too difficult to do so.
3. If the function is a rational function, find any vertical asymptotes and any horizontal asymptotes.
4. Investigate possible symmetry. If  $f(-x) = f(x)$ , the function is even, so the graph is symmetric about the  $y$ -axis. If  $f(-x) = -f(x)$ , the function is odd, so the graph is symmetric about the origin.
5. Find the first derivative. Locate any critical values by finding where the first derivative is zero or undefined. Find intervals where the function is increasing or decreasing and any relative maximums or minimums.
6. Find the second derivative. Locate possible inflection points by finding where the second derivative is zero or does not exist. Determine intervals where the function is concave upward or concave downward.
7. Plot the intercepts, the critical points, the inflection points, the asymptotes, and other points as needed. Take advantage of any symmetry found in step 4.
8. Connect the points with a smooth curve using the correct concavity, being careful not to connect points where the function is not defined.