Now I can sketch just about anything! Date:______________

Recall:

A complete analysis contains: intercepts, asymptotes, domain, Max/Min points, intervals of Inc/Dec, inflection points, intervals of CU/CD, and an accurate graph. You must also assess extrema using the first or second derivative tests.

The first derivative test:

1. If $f'(a)$ = 0 and $f(x)$ goes from increasing to decreasing then $x = a$ is a local maximum.
2. If $f'(a)$ = 0 and $f(x)$ goes from decreasing to increasing then $x = a$ is a local minimum.

The second derivative test:

For a function $f(x)$, where $f''(x)$ exists on an interval containing a

1. If $f'(a)$=0 and $f''(a) > 0$ then $x = a$ is a local minimum.
2. If $f'(a)$=0 and $f''(a) < 0$ then $x = a$ is a local maximum.

Complete a full analysis on the following functions and graph:

1. $y = x^2 e^{2x}$
2. $k(x) = \frac{x^2}{e^{2x}}$
3. $y = x - x^{\frac{1}{3}}$
4. $f(x) = x^{\frac{2}{3}} - 1$
5. $f(x) = x^{\frac{4}{3}} - 2x^{\frac{1}{3}}$
6. $y = x - \sqrt{x}$
7. $g(x) = \frac{1}{\sqrt{1 - x^2}}$

Solutions:

1. Max (-1, e^{-2}) Min (0, 0) IP when $x = -1 - \frac{\sqrt{2}}{2}$ and $x = \frac{\sqrt{2}}{2} - 1$	2. Max (1, e^{-2}) Min (0, 0) IP when $x = 1 - \frac{\sqrt{2}}{2}$ and $x = \frac{\sqrt{2}}{2} + 1$
3. Min ($\frac{1}{3\sqrt{3}}, \frac{-2}{3\sqrt{3}}$) Max ($\frac{-1}{3\sqrt{3}}, \frac{2}{3\sqrt{3}}$) IP (0,0)	4. Min (0,-1)
5. Min (0.5, -1.2) IP (-1, 3) (0, 0)	6. Min $\left(\frac{1}{4}, \frac{-1}{4}\right)$
7. Min (0, 1)	