Practice Quiz 4

1. Analyze the behavior of the function $f = \dfrac{4\,x^4 - 11\,x^2 - 9\,x^3 + 36\,x - 20}{4\,x^3 - 8\,x^2}$. By this we mean

   a. Find all intercepts.

   b. Find all local max, local min, and inflection points.

   c. Find all asymptotes.

   d. Supply a graph, or graphs, of f showing all the relevant behavior of f.

   e. Plot f, $\dfrac{\partial}{\partial x}f$, and $\dfrac{\partial}{\partial x}\left(\dfrac{\partial}{\partial x}f\right)$ all on the same axes. Label each on your printout.

2. Find the range of values of the parameter α so the the polynomial $p := -2\,x^3 + 2\,x^2 + 4\,x + \alpha$ has exactly 0, 1, 2, 3, or 4 real zeros. Supply graphs to support your conclusions.

3. Plot the graph of $y = \cos\left(\dfrac{x}{2}\right)$ along with its Taylor polynomial approximations at x=0 of orders 2 and 4 on the same axes.

4. Plot the graph of the relation $x\,y^2 - x - y^3 = 0$ along with all tangent lines corresponding to x=3.