Name:

Problem 1: Find the absolute maximum and absolute minimum values of the following functions on the given interval.

1. $f(x) = 2x^3 - 3x^3 - 12x + 1$ on $[-2, 3]$.
2. $f(x) = 2\cos(x) + \sin(2x)$ on $[0, \pi/2]$.
3. $f(x) = x^{200}(1-x)^{100}$ on $[0, 1]$.
4. $f(x) = \dfrac{\sqrt{x}}{1+x^2}$ on $[0, 2]$.

Problem 2: For the following functions, find the intervals of increase/decrease, the points of local maxima/minima, intervals of concavity/convexity and the inflection points.

1. $f(x) = \cos^2 x - 2\sin x$, for $0 \leq x \leq 2\pi$.
2. $f(x) = \dfrac{x^2}{x-1}$.
3. $f(x) = x\sqrt{6-x}$.
4. $f(x) = 5x^{2/3} - 2x^{5/3}$.