MATH 130 QUIZ 4 10/03/2011

Name_____KEY_____ Section 0251

Answer all problems. There are 10 possible points.

1. (6pts) Find the derivative of the following functions (Show all work to receive full credit!):

   a) $f(x) = \dfrac{6}{\sqrt[4]{x}}$

   $$f'(x) = \frac{-6}{4} x^{(\frac{-1}{4}-1)} = -\frac{3}{2} x^{\left(-\frac{1}{4}-\frac{4}{4}\right)} = -\frac{3}{2} x^{-\frac{5}{4}}.$$

   b) $g(x) = \dfrac{x^4 - 2x + 1}{x}$

   $$g(x) = \frac{x^4}{x} - \frac{2x}{x} + \frac{1}{x} = x^3 - 2 + x^{-1}.$$
   $$g'(x) = 3x^2 - x^{-2}.$$

2. (4pts) Find all the values of x where the tangent line of the function $f(x) = 2x^3 - 9x^2 - 24x + 6$ is horizontal (Show all work to receive full credit!):

The tangent line is horizontal if $f'(x) = 0$.

Therefore, $0 = f'(x) = 6x^2 - 18x - 24 = 6(x^2 - 3x - 4) = 6(x+1)(x-4)$.

Then $x = -1, 4$.