



Time: 1 hr.

MATH101
Second Semester, 00-01
QUIZ 2

9/5/01

1. Find dy/dx in each case:

a) $y = \tan^2 x - \sec x$

∞ b) $y = x^2 \sin(2x^2)$

c) $y = (3 + \cos^3 x)^{-1/3}$

d) $x^2 + xy + y^2 - 5x = 2$

κ e) $y = \left(\frac{\sqrt{x}}{1+x} \right)^2$

2. Find equations for the lines tangent and normal to the curve $x^3 + y^2 = 2$ at the point $(1, 1)$.

∞ 3. Use the chain rule to find dw/ds at $s = 0$ if $w = \sin(\sqrt{r} - 2)$ and $r = 8\sin(s + \frac{\pi}{6})$.

4. Given the function $f(x) = x^3 - 3x^2$, on $(-\infty, 3]$.

a) Find the intervals on which the function is increasing and decreasing.

b) Identify the function's local extreme values, if any, saying what they are and where they are taken on.

c) Which, if any, of the extreme values are absolute?

5. a) Define the derivative of a function $f(x)$ at $x = c$.

b) Use the definition in (a) to find the derivative of $f(x) = 3x^2 + 1$ at $x = c$.

c) The function $g(x) = \begin{cases} 3x^2 + 1, & x \leq 1 \\ 4, & x > 1 \end{cases}$ is continuous at $x = 1$. Is $g(x)$

differentiable at $x = 1$? Explain.

