Math 142
Calculus II
Spring 2002, USC

Feb 15, 2002

Midterm 1

Time: 50min

1. Differentiate:

a) $y = \tan(\ln e^{2x})$

b) $y = x^{\sinh x}$

c) $y = \dfrac{x\sqrt{x^2+13}}{(x-4)(\sqrt[3]{2x+1})}$

d) $y = 2^{(e^x)} + (2^e)^x$

2. Find

a) $\displaystyle\int \frac{x}{x^2+1}\,dx$

b) $\displaystyle\int \frac{1}{x^2+4x+8}\,dx$

c) $\displaystyle\int_0^{\pi/2} \sin^3\theta\,d\theta$

d) $\displaystyle\int e^x \sinh(e^x)\,dx$

3. Find $\tan(\sin^{-1} x)$ in terms of x.

4. A bacterial population grows at a rate proportional to its size. Initially it is 1000 and after 3 days it reaches 8000. What is the population after 5 days?

Each part is worth 10pts.

LaTeX ..... MG