

## Math 221 Quiz 9

Name \_\_\_\_\_ Section \_\_\_\_\_ Score \_\_\_\_/10

**Instructions.**

Please make sure to SHOW YOUR WORK, and do NOT skip steps.

1. (4 pts)  $f(x) = e^{\tan x} + \ln(e^{6x})$       $f'(x) = ?$

$$f(x) = e^{\tan x} + 6x$$

$$f'(x) = e^{\tan x} \sec^2 x + 6$$

2. (3 pts)  $\lim_{x \rightarrow \infty} \frac{e^{3x} + t^3 e^{-x}}{e^x - 2e^{3x}} \cdot \frac{\frac{1}{e^{3x}}}{\frac{1}{e^{3x}}}$

$$= \lim_{x \rightarrow \infty} \frac{1 + \frac{t^3}{e^{4x}}}{\frac{1}{e^{3x}} - 2} = -\frac{1}{2}$$

3. (3 pts)  $\lim_{x \rightarrow \infty} \ln(x + \pi) - \ln x$

$$= \lim_{x \rightarrow \infty} \ln \frac{x + \pi}{x}$$

$$\text{(because } \lim_{x \rightarrow \infty} \frac{x + \pi}{x} = 1 \text{)}$$

$$= \ln 1$$

$$= 0$$