MATH 31B QUIZ 1B.

Please enter your answers on your scantron card. Please also write your name, section number and whether you are taking quiz 1A or quiz 1B.

(1) What is the correct definition of a 1-1 function?
   (a) For each y, there is at most one x with $y = f(x)$
   (b) For each x, there is at most one y with $y = f(x)$
   (c) For each x, $f(x)$ has a unique value.
   (d) $f(x) = x^3$.
   (e) None of the above

   The answer is (a).

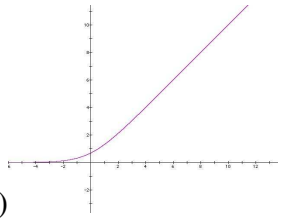
(2) Let $f(x) = \ln(x^3 \cos x)$. Then $f'(x)$ is equal to:
   (a) $\dfrac{1}{x^2 \cos x}$ (b) $\dfrac{3}{x} - \tan x$ (e) None of the above
   (c) $\dfrac{x^3 + \cos x}{-\sin x}$ (d) $\dfrac{2x^2 + \sin x}{x^3 \cos x}$

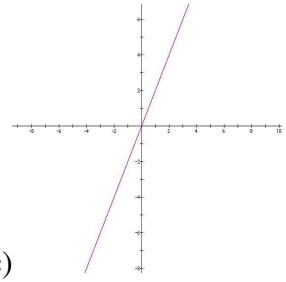
   The answer is (b): $\ln(x^3 \cos x) = 3 \ln x + \ln \cos x$; differentiating gives (b).

(3) Let $L = \lim_{t \to \infty} e^{1/t}$. Then
   (a) $L = 1$ (b) $L = \infty$ (e) None of the above
   (c) $L = 0$ (d) $L = -1$

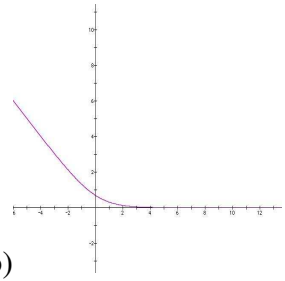
   The answer is (a): $1/t \to 0$ and $e^0 = 1$.

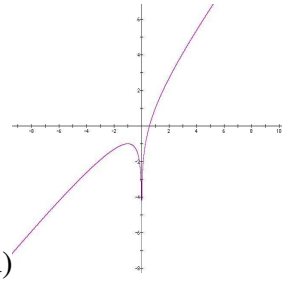
(4) Let $f(x) = \ln(e^{3x} \cdot e^{-x})$. Which is the graph of f?

(a) 

(c) 

(e) None of the above

(b) 

(d) 

The answer is (c): $\ln(e^{3x} e^{-x}) = \ln(e^{2x}) = 2x$.