

**Quiz 4 solutions—version A**

Name \_\_\_\_\_

Student ID Number \_\_\_\_\_

1. Differentiate the following functions of  $x$ (a)  $e^x/(\cos x)$ 

$$e^x(\cos x + \sin x)/(\cos^2 x) = e^x(\sec x)(1 + \tan x)$$

(other ways of expressing the answer are also possible)

(b)  $(x^2 - 4x)/x^3$ 

$$-x^{-2} + 8x^{-3}$$

(c)  $x/(1 + A/x)$ , where  $A$  is a constant

$$\frac{2Ax + x^2}{(A + x)^2}$$

2. Express the limit as a derivative  $f'(a)$ , and evaluate it:

$$\lim_{x \rightarrow 2} \frac{10^x - 100}{x - 2}$$

For  $f(x) = 10^x$ , the limit is  $f'(2) = 100 \ln 10$ .