

# Math 2215 - Calculus 1

## Quiz #3 - 2005.09.02

### Solutions

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1. Solve the following expression for  $y$ .

$$\ln(xy) = 12x^2 + 1$$

Taking the exponential of both sides yeilds

$$xy = e^{12x^2+1}$$

dividing both sides by  $x$  gives

$$y = \frac{1}{x} \left( e^{12x^2+1} \right).$$

2. Compute the following limit.

$$\lim_{x \rightarrow 2} \frac{\frac{1}{x} - \frac{1}{2}}{x^2 - 4}$$

First we combine terms in the numerator:

$$= \lim_{x \rightarrow 2} \frac{\frac{-2+x}{2x}}{x^2 - 4}$$

Next, multiply top and bottom by  $1/(2x)$  and factor the denominator to get:

$$= \lim_{x \rightarrow 2} \frac{-(x-2)}{2x(x+2)(x-2)}$$

Canceling  $x-2$  in the numerator and the denominator gives:

$$= \lim_{x \rightarrow 2} \frac{-1}{2x(x+2)} = -\frac{1}{16}$$