Quiz # 1 — 09/01/16

Answer all questions in a clear and concise manner. Remember that answers without explanation or that are poorly presented may not receive full credit.

1. Let $a, b \geq 1$ be constants. Simplify the following expression using properties of $\ln(x)$ and e^x:

$$\ln(a^3 \cdot e^{2b})$$

(a) $6b \ln(a + e)$

(b) $3 + 2b$

(c) $6b \ln(a)$

(d) $3 \ln(a) + 2b$

(e) $3 \ln(a) + 2be$

2. Let $f(x) = \sqrt{1 + x}$. Find $f^{-1}(x)$ and specify the domain and range of f^{-1}. **Hint:** Consider the domain and range of f.

We have the following

$$y = \sqrt{1 + x}$$
$$y^2 = 1 + x$$
$$y^2 - 1 = x$$

Switching x and y yields $f^{-1}(x) = x^2 - 1$. Note the domain of f is all x in the interval $[-1, \infty)$ and the range of f is the interval $[0, \infty)$. Thus the domain of the inverse, f^{-1}, is all x in $[0, \infty)$ and the range is $[-1, \infty)$.