

Quiz 6 Solutions
MAC 1147.3077, Fall 2015
Thursday, October 22, 2015

Show all relevant work to support your answer. A correct answer without supporting work will not earn the points. **Problems 3 and 4 are on the back.**

1. (1 point) What is your TA's first name? (Hint: There is no wrong answer)

1. Charles

2. (4 points) Use the one-to-one property to solve the equations for x :

(a) $e^{x^2+6} = e^{5x}$

Solution: Using the one-to-one property in your textbook, we get $x^2 + 6 = 5x$, or rewritten as $x^2 - 5x + 6 = 0$. Factoring this polynomial, we obtain $x = 2, 3$ as our solutions.

(b) $\ln(x^2 - x) = \ln(6)$.

Solution: Using the one-to-one property in your textbook, we get $x^2 - x = 6$, or rewritten as $x^2 - x - 6 = 0$. Factoring this polynomial, we obtain $x = 3, -2$ as our solutions.

Problems 3 and 4 are on the back.

3. (2 points) Use properties of logarithms to expand the following expression:

$$\ln(xyz^2)$$

Solution: Expanding using properties of logs from the book, we get:

$$\ln(xyz^2) = \ln x + \ln y + 2 \ln z$$

4. (3 points) Solve the system of non-linear equations by using the method of substitution:

$$\begin{cases} x - 2y = 0 \\ 3x - y^2 = 0 \end{cases}$$

Solution: Solving the first equation for x , we see $x = 2y$. Thus, substituting $x = 2y$ into the second equation, we get $3(2y) - y^2 = 0$, or rewritten as $0 = y^2 - 6y$. Then we factor out y so that $0 = y(y - 6)$, and hence $y = 0, 6$. Substituting each of these y values into the first equation, we obtain $(0, 0), (12, 6)$ as the solutions.