Meramec Math 160 C Quiz 16 Solution Fall 2013

NAME: _____Score_____/20

1. **T** F If f and g are inverse functions, then $f \circ g(x) = g \circ f(x)$.

2. **T** F If f and g are inverse functions, then $f \circ g(x) = g \circ f(x) = x$

3. T **F** $\ln \circ \exp(3x - 7) = x$

4. T **F** log and $\exp_8$ are inverses.

5. **T** F $\exp_3$ and $\log_3$ are inverses.

6. **T** F Every exponential function has an inverse.

7. **T** F Every logarithmic function has an inverse.

8. T **F** $\log \circ \exp(x) = x$.

9. **T** F log(1) = 0.

10. **T** F exp(0) = 1.

11. T **F** Every matrix has an inverse

12. T **F** Matrix multiplication is commutative.

13. What is the rule for the function named $\exp_5$
$\exp_5(x) = 5^x$ If you got this wrong, write $\exp_b(x) = b^x$ ten times.

14. What is the name of the function which is the inverse of exp **ln**
If you got this wrong write the following at least ten times.
exp and ln are inverses
log and $\exp_{10}$ are inverses
$\log_b$ and $\exp_b$ are inverses

15. Write 4 = ln(5) in exponential form

$$4 = \ln(5)$$

$$\exp(4) = \exp \circ \ln(5)$$

$$e^4 = 5$$

To convert from logarithmic statement to exponential statement or vice versa, use the inverse of the function in the original statement.

16. If A is a 3X5 matrix and B is a 5X7 matrix, is the product AB defined? If yes what is the order of the product AB? **Yes and its order will be 3X7**

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17. Write the coefficient matrix of the following system of equations: $\begin{cases} -2x + 2y - 4z = 1 \\ 2x - 5y - z = 6 \\ 4x + 2y - 3z = 5 \end{cases}$

$$\begin{bmatrix} -2 & 2 & -4 \\ 2 & -5 & -1 \\ 4 & 2 & -3 \end{bmatrix}$$

18. Write the 3×3 identity matrix.

$$\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

19. Perform the multiplication: $\begin{bmatrix} 1 & 2 & -4 \\ -2 & -3 & 3 \end{bmatrix} \begin{bmatrix} 2 & -2 \\ 3 & 1 \\ -1 & 2 \end{bmatrix} = \begin{bmatrix} 12 & -8 \\ -16 & 7 \end{bmatrix}$

20. Solve the equation $e^{5x-3} - 2 = 10,476$

$e^{5x-3} - 2 = 10,476$

$e^{5x-3} = 10478$

$\exp(5x - 3) = 10478$

$\ln \circ \exp(5x - 3) = \ln(10478)$

$5x - 3 = \ln(10478)$

$5x = 3 + \ln(10478)$

$x = \dfrac{3 + \ln(10478)}{5}$

Some of you did things like

$5x - 3 = \ln(10478)$

$5x = \ln(10481)$

Which is similar to doing this

$5x - 3 = \sqrt{10478}$

$5x = \sqrt{10478 + 3}$

Which you would never do.

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