Math 110 Common Exam #1

February 13, 2019

Time: 1 hour and 25 minutes

Instructions: Show all work for full credit.
No outside materials or calculators allowed.

Extra Space: Use the backs of each sheet for extra space. Clearly label when doing so.

Name: _____

ID #: _____

Instructor/Section: _____

"I pledge by my honor that I have abided by the NJIT Academic Integrity Code."

_____ (Signature)

Problem		Score

1. Determine if the following equalities are TRUE or FALSE: (3 pts each)

   a. $log_b\left(\frac{r}{5}\right) = log_b\, r - log_b\, 5$

   b. $\frac{log_b r}{t} = log_b\left(r^{\frac{1}{t}}\right)$

   c. $\frac{log_b\ a}{log_b\ c} = log_b\left(\frac{a}{c}\right)$

   d. $log_b\ (ab)^t = t(log_b\ a) + t$

2. Simplify as much as possible (**assume all variables represent positive numbers**: (5 pts each)

   a. $(\sqrt{5}-\sqrt{6})^2$

   b. $\frac{\sqrt[3]{40m}}{\sqrt[3]{5m}}$

   c. $\sqrt{3y^4z}\sqrt{20z}$

3. Solve the equations: (5 pts each)

a. $\frac{(e^{3x+1})^2}{e^4} = e^{10x}$

b. $5^{x^2-4x+5} = 25$

c. $3^{4-x} = 27^x$

d. $x(\ln(6^{-1})) = ln6$

4. Graph the function:**Be sure to identify any asymptotes (5 pts each)

   a. $f(x) = 8 + 5(3)^x$

   b. $f(x) = 2^{x-5}$

   c. $f(x) = \ln(2 - x) - 3$

5. Solve the following equations **be sure to identify any non-valid (extraneous) solutions (5 pts each)

   a. $ln(x-3)+ln(2x+1)=2(lnx)$

   b. $\ln(x-3)=5-\ln(x-3)$

   c. $\ln(logx)=0$

6. The second hand on a clock is 6 inches long. How far does the tip of the second hand move in 15 seconds? Use the formula $s = r\theta$ (6 pts)

7. A merry go round makes 8 revolutions per minute (5 pts each)

    a. What is the angular speed of the merry go round in radians per minute?

    b. How fast is a horse 12 feet from the center traveling? Use the formula $v = r\omega$

8. If it is known that $log_3(log_4 y) = 0$, find the value of y. (7 pts)