MATH 1113 Precalculus
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Name: Solutions
Date: June 30, 2017

Quiz No. 3

Show all of your work, label your answers clearly, and do not use a calculator.

Problem 1 For each of the following, indicate whether the statement is true or false.

a $2^{x+y} = 2^x 2^y$

T

b $\sqrt{a^2+b^2} = a+b$

F

b $\log(m^2+n) = 2\log(m) + \log(n)$

F

c $\log(2xy) = \log(2) + \log(x) + \log(y)$

T

d $e^{\log(x)} = x$

T

e $\log_2(32) = 5$

T

f $\ln(\frac{1}{e}) = e$

F

Problem 2 Graph each of the following functions. Remember to plot several points on each of your graphs.

a $f(x) = 2^x$

You can look there up yourself

b $f(x) = \log_2(x)$

c $f(x) = \left(\frac{1}{2}\right)^x$

Problem 3

a Suppose you invest \$100 in a savings account that pays 3.2% annual interest, compounded quarterly (four times per year). Write down a formula for how much money you would have in the savings account after t years.

$$A(t) = 100\left(1 + \frac{.032}{4}\right)^{4t}$$

b How much money would you have after 7 years? (Remember that you don't need to simplify your answer.)

$$A(7) = 100\left(1 + \frac{.032}{4}\right)^{4(7)}$$

c Now suppose that you invest the same \$100 in a different savings account that pays 3.2% annual interest, but compounded continuously. Write down a formula for how much money you would have in the savings account after t years.

$$A(t) = 100e^{.032t}$$

d How much money would you have after 7 years in this different savings account?

$$A(7) = 100e^{.032(7)}$$

Problem 4 For each of the following expressions, simplify so that each log is as simply to evaluate as possible.

a $\log\left(\frac{\sqrt{y^3}x^1 5z^{-2}}{100x^1 3w^2}\right)$ $= \log\left(y^{3/2} z^{-2} 60^{-1} w^{-2}\right)$

$= \frac{3}{2}\log(y) - 2\log(z) - \log(60) - 2\log(w)$

$= \frac{3}{2}\log(y) - 2\log(z) - 1 - \log(6) - 2\log(w)$

b $\log_2\left(\frac{\sqrt{x+8y}w^{-2}}{4}\right)$ $= \log_2\left((x+8y)^{1/2} w^{-2} 4^{-1}\right)$

$= \frac{1}{2}\log_2(x+8y) - 2\log(w) - \log_2(4)$

$= \frac{1}{2}\log_2(x+8y) - 2\log(w) - 2$

c $\ln\left((3xy)^{3/2}\right)$

$= \frac{3}{2}\left[\ln(3) + \ln(x) + \ln(y)\right]$

d $\log_5\left(25 + (3xy)^{3/2}\right)$

Can't be simplified