Universidad de Puerto Rico
Departamento de Matemáticas
MATE 3018 – Repaso 6–

Apellidos: _____ _____ Nombre _____
No. Estudiante: _____ Profesor: _____ Sección _____

(1) Define the Exponential Function and give its properties.

(2) Let $f(x) = 3^x$. Graph f and the function $F(x) = 2 - f(x-1)$ and find:
   (a) $D_F =$

   (b) $CV_F =$

   (c) The x and y-Intercepts of the graphs of $y = F(x)$

(3) Consider the function $G(x) = 3^{x-2}$. Find

   (a) $D_G =$

   (b) $CV_G =$

   (c) Find a formula for G^{-1}.

   (d) Graph G and G^{-1} in the same system of coordinates plan.

(4) Define the logarithm function and give its properties

(5) Consider the function $g(x) = \log_2(2 - 3x)$. Find

(a) $D_g =$

(b) $CV_g =$

(c) Find a formula for g^{-1}.

(d) Graph g and g^{-1} in the same in the same system of coordinates plan.

(6) Given that $\log_b(t) = .3, \log_b(r) = .5, \log_b(s) = .6$, find:

(a) $\log_b t^3 \sqrt[4]{r^3} =$

(b) $\dfrac{\log_b(s^2)}{\log_b(\sqrt[3]{t})} =$

(c) $\left(\log_b(r^2)\right)^2 =$

(d) $\dfrac{\log_b(r)}{\log_b(t)} =$

(e) $\log_b\left(\dfrac{s}{t}\right) =$

(f) $\log_b\left(\dfrac{r}{s}\right)$

(7) Simplify the following expressions.

(a) $e^{\ln(3) - 4\ln(5)} =$

(b) $(\log(3))\,(\log_9(10)) =$

(8) Solve the following equations over the set of real numbers $\mathbb{R}$.

(a) $\log_4(x) + \log_4(x-3) = 1$

(b) $\ln(x+1) - \ln(x) = 2$.

(c) $3^{1-2x} = 4$

(d) $\log_a(x-1) - \log_a(x+6) = \log_a(x-2) - \log_a(x+3)$

(e) $(\log_2(x+3))^2 - 3\log_2(x+3) + 2 = 0$

(f) $2^{2x} - 12 \cdot 2^x + 32 = 0$

(9) Graph $f(x) = \log_3(x^2)$ and $g(x) = 2\log_3(x)$. For which values of x is $f(x) = g(x)$?

(10) If $f(x) = e^{2^{x-1}}$ and $g(x) = \ln(x)$, find a formula and graph $g \circ f$. Find also $D_{g\circ f}$ and $CV_{g\circ f}$.

(11) If $f(x) = \log_b(x)$, evaluate and simplify $\dfrac{f(x+h) - f(x)}{h}$.

(12) Show that $f(x) = \log_b|x|$ is an even function. Find D_f and CV_f.