1.(1 pt) Evaluate the following expressions.
(a) $\log_6 6^{11} =$ _____
(b) $\log_3 27 =$ _____
(c) $\log_5 125 =$ _____
(d) $\log_2 2^5 =$ _____

2.(1 pt) Evaluate the following expressions.
(a) $\log_2\left(\frac{1}{16}\right) =$ _____
(b) $\log_2 1 =$ _____
(c) $\log_4 \sqrt{1024} =$ _____
(d) $5^{\log_5 9} =$ _____

3.(1 pt) Evaluate the following expressions.
$\log_5 0.0016$ _____
$\log_{10} 0.001$ _____
$\log_{1024} \sqrt{4}$ _____
$\log_4 8$ _____

4.(1 pt) Evaluate the following expressions.
(a) $\ln e^{-3} =$ _____
(b) $e^{\ln 6} =$ _____
(c) $e^{\ln \sqrt{4}} =$ _____
(d) $\ln(1/e^3) =$ _____

5.(1 pt)
(a) If $\log_3 x = 3$, then $x =$ _____ .
(b) If $\log_5 x = 2$, then $x =$ _____ .

6.(1 pt)
(a) If $\log_x 8 = 3$, then $x =$ _____ .
(b) If $\log_x 16 = 2$, then $x =$ _____ .

7.(1 pt)
(a) If $6^x = 32$, then $x =$ _____ .
(b) If $14^{-x} = 6$, then $x =$ _____ .

8.(1 pt) Solve the given equation for x.
$3^{x-2} = 5$
$x =$ _____

9.(1 pt) Solve the given equation for x.
$5^{4x-4} = 38$
$x =$ _____

10.(1 pt)
If $\ln(4x+6) = 3$, then $x =$ _____ .

11.(1 pt) If $e^{3x} = 26$, then $x =$ _____ .

12.(1 pt) Match the statements defined below with the letters labeling their equivalent expressions.

__ 1. $\ln(y^x)$
__ 2. $\ln(xy)$
__ 3. $\ln\frac{x}{y}$
__ 4. $\ln(x^y)$

A. $x\ln y$
B. $\ln x + \ln y$
C. $y\ln x$
D. $\ln x - \ln y$

13.(1 pt) Enter a T or an F in each answer space below to indicate whether the corresponding statement is true or false.
You must get all of the answers correct to receive credit.

__ 1. $(\ln a)^b = b\ln a$
__ 2. $\frac{\ln x}{\ln y} = \ln x - \ln y$
__ 3. $\log_a b = \log_b a$
__ 4. $\ln(x-y) = \ln x - \ln y$

14.(1 pt)

$$\ln(r^5 s^6 \sqrt[10]{r^2 s^3})$$

is equal to

$$A\ln r + B\ln s$$

where $A =$ _____ and where $B =$ _____

15.(1 pt) Evaluate the following expressions.
(a) $e^{5\ln 4} =$ _____
(b) $10^{4\log_{10} 5} =$ _____
(c) $\log_2 8^9 =$ _____
[NOTE: Your answers cannot be algebraic expressions.]

16.(1 pt) If $\ln x + \ln(x-7) = \ln 6x$, then $x =$ _____ .

17.(1 pt) Solve the given equation for x.
$\log_{10} x + \log_{10}(x+48) = 2$
$x =$ _____

18.(1 pt) Solve the given equation for x.
$7^{x/5} = 3$
$x =$ _____

19.(1 pt) Solve the given equation for x.
$\left(\frac{1}{5}\right)^x = 10$
$x =$ _____

20.(1 pt) Rewrite the expression in terms of ln
$\log_7 11 =$ _____

21.(1 pt) Rewrite the expression in terms of ln
$\log_{12} 8 =$ _____

22.(1 pt) The equation $x^2 * 7^x - 7x * 7^x = 0$ has two roots. The smaller root is _____ and the bigger root is _____

23.(1 pt) The equation $4x^6 e^{-9x} - 2x^7 e^{-9x} = 0$ has two roots.
The smaller root is _____
and the bigger root is _____ .

24.(1 pt) The equation $e^{2x} - 9e^x + 20 = 0$ has two solutions.
The smaller one is: _____
and the larger one is: _____ .

25.(1 pt) If $e^{2x} - 1e^x = +20$, then $x =$ _____ .

26.(1 pt) For each of the following, find the base b if the graph of $y = b^x$ contains the given point.
$(3,8)$ $b =$ _____
$(2,16)$ $b =$ _____
$(0.5,2)$ $b =$ _____
$(0.5, 1.73205080756888)$ $b =$ _____
$(4,1)$ $b =$ _____

$(3,64)$ $b =$ _____

$(3,1)$ $b =$ _____

$(-4,0.0625)$ $b =$ _____

$(3,125)$ $b =$ _____

$(1,1)$ $b =$ _____

27.(1 pt) Determine the smallest integer x that satisfies the given inequality.

$9^{\sqrt{2x}} > 26$

$x >$ _____

$x^{\sqrt{4}} > 113$

$x >$ _____

$3.8^{\sqrt{3x}} > 31$

$x >$ _____

$x^{\sqrt{\frac{9}{4}}} > 31$

$x >$ _____

28.(1 pt) Starting with the graph of $f(x) = 8^x$, write the equation of the graph that results from

(a) shifting $f(x)$ 4 units upward. $y =$ _____

(b) shifting $f(x)$ 6 units to the right. $y =$ _____

(c) reflecting $f(x)$ about the x-axis. $y =$ _____

(d) reflecting $f(x)$ about the line x = 3. $y =$ _____