

WeBWorK assignment number MPT_Practice_Log_2011 is due : 09/14/2012 at 11:00pm PDT.

The following link

<http://mathweb1.sandbox.csun.edu/mpt/>

contains other important information about this course.

The primary purpose of WeBWorK is to let you know that you are getting the correct answer or to alert you if you are making some kind of mistake. Usually you can attempt a problem as many times as you want before the due date. However, if you are having trouble figuring out your error, you should consult the book, or ask a fellow student, one of the TA's or your professor for help. Don't spend a lot of time guessing – it's not very efficient or effective.

Give 4 or 5 significant digits for (floating point) numerical answers. For most problems when entering numerical answers, you can if you wish enter elementary expressions such as $2 \wedge 3$ instead of 8, $\sin(3 * \pi/2)$ instead of -1, $e \wedge (\ln(2))$ instead of 2, $(2 + \tan(3)) * (4 - \sin(5)) \wedge 6 - 7/8$ instead of 27620.3413, etc. Here's the **list of the functions** which WeBWorK understands.

You can use the Feedback button on each problem page to send e-mail to the professors.

1. (1 pt) Express the equation in exponential form

(a) $\ln 4 = x$ is equivalent to $e^A = B$.

A = _____

and

B = _____

(b) $\ln x = 3$ is equivalent to $e^C = D$.

C = _____

and

D = _____

Answer(s) submitted:

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(incorrect)

2. (1 pt) You can compute the following logarithms with your basic knowledge of powers.

For example, since

$$2^3 = 8$$

we know that

$$\log_2 8 = 3.$$

$\log_5 25 = \underline{\hspace{2cm}}$.

$\log_6 36 = \underline{\hspace{2cm}}$.

$\log_3 27 = \underline{\hspace{2cm}}$.

$\log_{10} 10,000 = \underline{\hspace{2cm}}$.

$\log_{10} 0.001 = \underline{\hspace{2cm}}$.

$\log_{\pi} 1 = \underline{\hspace{2cm}}$.

Hint: To get started observe that $5^2 = 25$.

Answer(s) submitted:

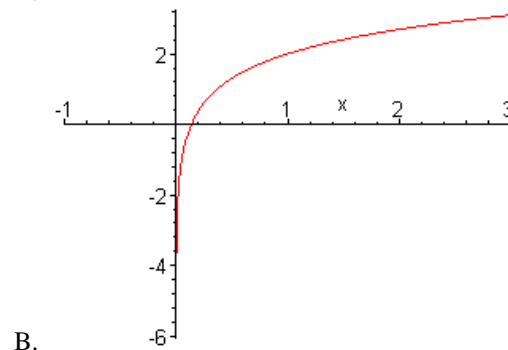
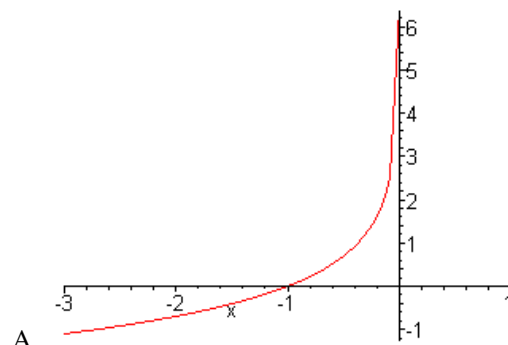
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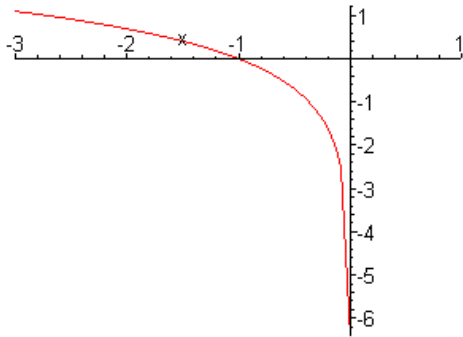
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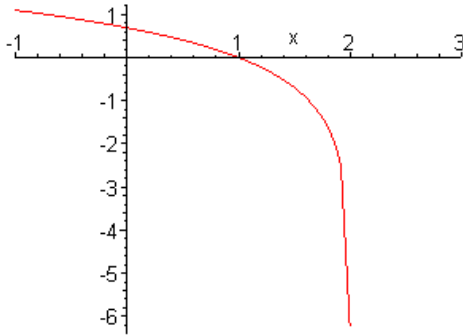
3. (1 pt) Match the functions with their graphs. Enter the letter of the graph below which corresponds to the function.

- ___1. $f(x) = \ln(2 - x)$
- ___2. $f(x) = -\ln(-x)$
- ___3. $f(x) = \ln(-x)$
- ___4. $f(x) = \ln(x - 2)$
- ___5. $f(x) = 2 + \ln x$

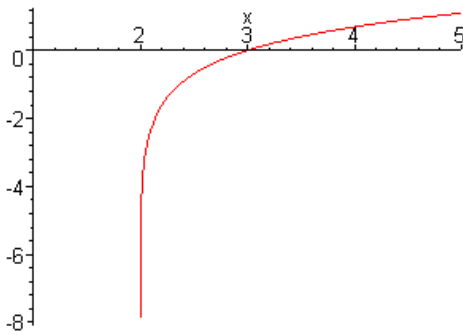




C.



D.

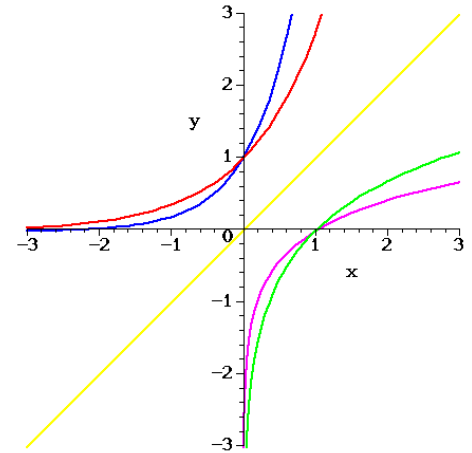


E.

Answer(s) submitted:

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(incorrect)



4. (1 pt)

The Figure above shows the graphs of five functions, listed below. Match the functions with the colors, using b for blue, r for red, g for green, p for purple, and y for yellow.

- ___: $f(x) = x$.
- ___: $f(x) = e^x$.
- ___: $f(x) = 5^x$.
- ___: $f(x) = \ln(x)$.
- ___: $f(x) = \log_5(x)$.

Hint: You know the graphs of the exponential functions, and you that the logarithms are the inverses of the exponential functions.

Answer(s) submitted:

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(incorrect)

5. (1 pt) The graph of the function $f(x) = 6 + \log_2 x$ can be obtained from the graph of $g(x) = \log_2 x$ by one of the following actions:

- (a) shifting the graph of $g(x)$ to the right 6 units;
- (b) shifting the graph of $g(x)$ to the left 6 units;
- (c) shifting the graph of $g(x)$ upward 6 units;
- (d) shifting the graph of $g(x)$ downward 6 units;

Your answer is (input a, b, c, or d) _____

The domain of the function $f(x)$ is $x > A$, find A

The value of A is _____

Is the range of the function $f(x)$ still $(-\infty, \infty)$?

Your answer is (input Yes or No) _____

Answer(s) submitted:

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(incorrect)

6. (1 pt) The graph of the function $y = \log_a x$ goes through $(3, -1)$.

Then $a = 1/$ _____

Answer(s) submitted:

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(incorrect)

7. (1 pt) Match the statements defined below with the letters labeling their equivalent expressions.

- ___1. $\ln(y^x)$
- ___2. $\ln \frac{x}{y}$
- ___3. $\ln(xy)$
- ___4. $\ln(x^y)$

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

Answer(s) submitted:

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(incorrect)

8. (1 pt) Evaluate the following expressions.

(a) $\ln e^{-11} =$ _____

(b) $e^{\ln 7} =$ _____

(c) $e^{\ln \sqrt{4}} =$ _____

(d) $\ln(1/e^5) =$ _____

Answer(s) submitted:

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(incorrect)

9. (1 pt) Rewrite the expression

$$3 \log x - 3 \log(x^2 + 1) + 5 \log(x - 1)$$

as a single logarithm $\log A$. Then the function

$A =$ _____

Answer(s) submitted:

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(incorrect)

10. (1 pt) Simplify the following expressions. Your answers must be exact and in simplest form.

(a) $\log_2 2^{-7x+5} =$ _____

(b) $6^{\log_6(-4+2q)} =$ _____

(c) $\log_4 0.5^k =$ _____

(d) $7^{6 \log_7 8 - 8 \log_7 6} =$ _____

Answer(s) submitted:

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(incorrect)

11. (1 pt) Use the Laws of logarithms to rewrite the expression

$$\ln \left(x^7 \sqrt{\frac{y^6}{z^{12}}} \right)$$

in a form with no logarithm of a product, quotient or power. After rewriting we have

$$\ln \left(x^7 \sqrt{\frac{y^6}{z^{12}}} \right) = A \ln(x) + B \ln(y) + C \ln(z)$$

with the constant

$A =$ _____

the constant

$B =$ _____

and the constant

$C =$ _____

Answer(s) submitted:

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(incorrect)

12. (1 pt) Use the Laws of logarithms to rewrite the expression

$$\log \left(\frac{x^{19} y^{20}}{z^5} \right)$$

in a form with no logarithm of a product, quotient or power. After rewriting we have

$$\log \left(\frac{x^{19} y^{20}}{z^5} \right) = A \log(x) + B \log(y) + C \log(z)$$

with

$A =$ _____

$B =$ _____

and

$C =$ _____

Answer(s) submitted:

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(incorrect)

13. (1 pt) Before calculators were widely available people used logarithm tables to simplify multiplication and division, using the fact that the logarithm of a product equals the sum of the logarithms and the logarithm of the quotient equals the difference of the logarithms.

These tables were constructed by computing laboriously and carefully the logarithms of a few selected numbers and then combining the logarithms using the rules just mentioned.

This exercise suggest how the process may have worked.

Let

$$L(x) = \log_a(x)$$

where we don't know the base a . However, we do know that

$$L(2) = 0.36441 \quad \text{and} \quad L(3) = 0.57757.$$

Use this information to compute

- $L(6) =$ _____.
- $L(9) =$ _____.
- $L(12) =$ _____.
- $L\left(\frac{2}{3}\right) =$ _____.
- $L(3^{10}) =$ _____.
- $L(1) =$ _____.

Answer(s) submitted:

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(incorrect)

14. (1 pt) Evaluate the expression, reducing to simplest form $\log(\log 10000^{1000}) = _ + \log _$ **Note.** Your answers must be integers.

Answer(s) submitted:

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(incorrect)

15. (1 pt)

$$\ln(r^7 s^8 \sqrt[6]{r^8 s^5})$$

is equal to

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

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

Answer(s) submitted:

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(incorrect)

16. (1 pt) The inverse of the function

$$f(x) = e^{x-1}$$

is

$$f^{-1}(x) = _$$

Answer(s) submitted:

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(incorrect)

17. (1 pt) The inverse of the function

$$f(x) = \ln(x-1) - \ln(2x+1)$$

is

$$f^{-1}(x) = _$$

Hint: First apply suitable properties of the logarithm, and then apply the exponential.

Answer(s) submitted:

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(incorrect)

18. (1 pt) Solve for x :

$$\frac{9}{5} \log_5 x = -3$$

$x =$ _____

Answer(s) submitted:

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(incorrect)

19. (1 pt)

Solve for x in each of the following.

(a) If $\log_x 512 = \frac{9}{4}$, then $x =$ _____.

(b) If $6^{2x+8} = 4$, then $x =$ _____.

Answer(s) submitted:

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(incorrect)

20. (1 pt) Find the solution of the logarithmic equation

$$\log(3x + 4) = 2$$

in terms of logarithms, or correct to four decimal places.

Your answer is

$x =$ _____

Answer(s) submitted:

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(incorrect)

21. (1 pt) **Logarithmic Equations.** Understand how to solve equations involving logarithms. For example, the solution of the equation

$$\ln 12 - \ln(x - 1) = \ln(x - 2)$$

is

$x =$ _____

Answer(s) submitted:

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(incorrect)

22. (1 pt) Find the solution of the logarithmic equation

$$\log x + \log(x - 14) = \log(19x)$$

in terms of logarithms, or correct to four decimal places.

Your answer is

$x =$ _____

Answer(s) submitted:

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(incorrect)

23. (1 pt) Find the solution of the logarithmic equation

$$\log_2(x^2 + 1x - 26) = 2$$

in terms of logarithms, or correct to four decimal places.

Your answers are $x_1 =$ _____ and $x_2 =$ _____ with $x_1 \leq x_2$

Answer(s) submitted:

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(incorrect)

24. (1 pt) Solve for x in terms of k .

$$\log_9 x^8 - \log_9 x^{-9} = k.$$

$x =$ _____

Find x if $k = 9$. _____

Answer(s) submitted:

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(incorrect)

25. (1 pt) Determine the smallest integer x that satisfies the given inequality.

$$2\sqrt{2x} > 31$$

$$x > \frac{\quad}{\quad}$$

$$x^{\sqrt{3}} > 109$$

$$x > \frac{\quad}{\quad}$$

$$3.8^{\sqrt{3x}} > 22$$

$$x > \frac{\quad}{\quad}$$

$$x^{\sqrt{\frac{2}{3}}} > 22$$

$$x > \frac{\quad}{\quad}$$

Answer(s) submitted:

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(incorrect)

26. (1 pt) Solve for x in terms of a and b .

$$\log x = 7(\log a + \log b) + 3 \log b^5 + 5(\log b - \log a)$$

$x =$ _____

Answer(s) submitted:

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(incorrect)