35 Logarithmic Functions

Due:
12/15/2015 at 06:00am EST.

Students will be able to:

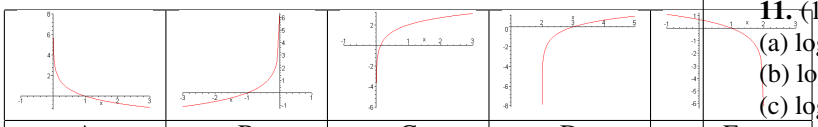
- Switch exponential expressions into logarithmic form
- Switch logarithmic expressions into exponential form
- Identify graphs of basic logarithmic functions
- Determine the domain and range of simple logarithmic functions
- Evaluate expressions involving logarithmic and exponential functions
- Solve basic exponential and logarithmic equations

Functions and symbols that WeBWorK understands.

Links to some useful WeBWorK pages for students

1. (1 pt) Match the functions with their graphs. Enter the letter of the graph below which corresponds to the function. (**Click on image for a larger view**)

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



A	B	C	D	E

2. (1 pt) Use the function below to answer the question

$f(x) = \ln\left(5 - \dfrac{3(x+6)}{2}\right)$

What is the domain of the function ? _____

Express your answer in interval notation

3. (1 pt) Use the function below to answer the question

$f(x) = \ln(3x+4)$

What is the domain of the function ? _____

Express your answer in interval notation

4. (1 pt) Evaluate the following expressions, and fill in the table with your solutions.

Expression	Solution
$\log_3(\frac{1}{81})$	_____
$\log_8 1$	_____
$\log_5 \sqrt{125}$	_____
$6^{\log_6 7}$	_____

5. (1 pt) Evaluate the following expressions.

(a) $\ln e^3 =$ _____

(b) $e^{\ln 5} =$ _____

(c) $e^{\ln\sqrt{3}} =$ _____

(d) $\ln(1/e^3) =$ _____

6. (1 pt)

If $\ln(7x+3) = 3$, then $x =$ _____.

7. (1 pt) If $e^{4x} = 23$, then $x =$ _____.

8. (1 pt) Express the equation in exponential form:

(a) $\log_{32} 2 = \frac{1}{5}$.

That is, write your answer in the form $32^A = B$. Then:

A = _____, B = _____

(b) $\log_2 \frac{1}{32} = -5$.

That is, write your answer in the form $2^C = D$. Then:

C = _____, D = _____

9. (1 pt) Express the equation in exponential form:

(a) $\ln 5 = x$ is equivalent to $e^A = B$.

A = _____, B = _____

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

C = _____, D = _____

10. (1 pt) Express the equation in logarithmic form:

(a) $4^5 = 1024$ is equivalent to $\log_4 A = B$.

A = _____, B = _____

(b) $10^{-4} = 1/10000$ is equivalent to $\log_{10} C = D$.

C = _____, D = _____

11. (1 pt) Evaluate the expression:

(a) $\log_2 2^2$ = _____

(b) $\log_2 32$ = _____

(c) $\log_2 2$ = _____

12. (1 pt) Evaluate the following expressions, and fill in the table with your solutions that are reduced to the simplest form.

Expression	Solution
$\log_3\left(\frac{1}{27}\right)$	_____
$\log \sqrt[4]{10}$	_____
$\log 0.01$	_____

13. (1 pt) Evaluate the following expressions, and fill in the table with your solutions that are reduced to the simplest form.

Expression	Solution
$\ln e^{-1}$	_____
$\ln e^6$	_____
$\ln(1/e)$	_____

14. (1 pt) Find x.

(a) $\log_7 x = 2$

Your answer is: _____

(b) $\log_2 16 = x$

Your answer is: _____

15. (1 pt) Find x.

(a) $\log x = 3$

$x =$ _____

(b) $\log_5 x = 3$

$x =$ _____

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16. (1 pt) Find x.

(a) $\log_x 27 = 3$

$x =$ _____

(b) $\log_x 16 = 2$

$x =$ _____

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17. (1 pt) If the graph of the function $y = \log_a x$ goes through $(26, 1)$, then:

$a =$ _____

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18. (1 pt) The graph of the function $y = \log_a x$ goes through $(37, -1)$.

_____

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19. (1 pt) The graph of the function $f(x) = \log_2(x-1)$ 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 1 units;

(b) shifting the graph of $g(x)$ to the left 1 units;

(c) shifting the graph of $g(x)$ upward 1 units;

(d) shifting the graph of $g(x)$ downward 1 units;

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

The domain of the function is _____

Is the range of the function is _____

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20. (1 pt) The graph of the function $f(x) = 5 + \log_2 x$ 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 5 units;

(b) shifting the graph of $g(x)$ to the left 5 units;

(c) shifting the graph of $g(x)$ upward 5 units;

(d) shifting the graph of $g(x)$ downward 5 units;

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

The domain of the function is _____

Is the range of the function is _____

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21. (1 pt) Find the solution of the exponential equation

$19e^x = 2$

$x =$ _____

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

$e^{1-4x} = 5$

$x =$ _____

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

$\ln x = 7$

Your answer is

$x =$ _____