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Webwork problems from Stewart (5th. ed.).

**Math 3A Section 2 Fall 2010**

WeBWorK assignment 1 due 10/2/05 at 11:59 PM.

**1.(1 pt)**

$e$  is defined as the value of  $a$  such that the slope of the tangent line at  $x = 0$  on the graph of  $y = a^x$  is exactly 1. What is the approximate value of  $e$  accurate to five decimal places?

**2.(1 pt)**

Which of the following explains how to obtain the graph of  $y = 4^{x-3}$  from the graph of  $y = 4^x$ ?

- (a) Shift the graph of  $y = 4^x$  up 3 units.  
 (b) Shift the graph of  $y = 4^x$  down 3 units.  
 (c) Shift the graph of  $y = 4^x$  to the left 3 units.  
 (d) Shift the graph of  $y = 4^x$  to the right 3 units.

**3.(1 pt)**

Which of the following explains how to obtain the graph of  $y = -2^{-x}$  from the graph of  $y = 2^x$ ?

- (a) Reflect the graph of  $y = 2^x$  about the y-axis and then reflect this result about the x-axis.  
 (b) Reflect the graph of  $y = 2^{-x}$  about the y-axis.  
 (c) None of the above.

**4.(1 pt)**

Find the domain of each function. If the answer is all real numbers, enter "r" below.

- (a)  $f(x) = \frac{1}{1+e^x}$   
 (b)  $f(x) = \frac{1}{1-e^x}$

(a)  $x =$  \_\_\_\_\_ (b)  $x \neq$  \_\_\_\_\_

**5.(1 pt)**

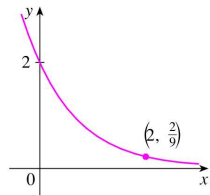
Find the domain of each function. If the answer is all real numbers, enter "r" below.

- (a)  $g(t) = \sin e^{-t}$   
 (b)  $g(t) = \sqrt{1-2^t}$

(a)  $x =$  \_\_\_\_\_ (b)  $x \leq$  \_\_\_\_\_

**6.(1 pt)**

Find the exponential function  $f(x) = Ca^x$  whose graph is given below.



$f(x) =$  \_\_\_\_\_

**7.(1 pt)**

If  $f(x) = 5^x$ , find  $\frac{f(x+h)-f(x)}{h}$ .

**8.(1 pt)**

How can you tell from the graph of a function whether it is one-to-one?

- (a) Use the Vertical Line Test.  
 (b) Use the Horizontal Line Test.  
 (c) None of the above.

**9.(1 pt)**

A function is given by a table of values, a graph, a formula, or a verbal description. Determine whether it is one-to-one. If it is one-to-one, enter "y" below. If not, enter "n" below.

$$f(x) = \frac{1}{2}(x+5)$$

**10.(1 pt)**

A function is given by a table of values, a graph, a formula, or a verbal description. Determine whether it is one-to-one. If it is one-to-one, enter "y" below. If not, enter "n" below.

$$f(x) = 1 + 4x - x^2$$

**11.(1 pt)**

If  $f$  is a one-to-one function such that  $f(2) = 4$ , what is  $f^{-1}(4)$ ?

**12.(1 pt)**

If  $g(x) = 3 + x + e^x$ , find  $g^{-1}(4)$ .

**13.(1 pt)**

Find the exact value of each expression.

- (a)  $\log_2 64$   
 (b)  $\log_6 \frac{1}{36}$   
 (a) \_\_\_\_\_  
 (b) \_\_\_\_\_

**14.(1 pt)**

Find the exact value of each expression.

- (a)  $\log_8 2$   
 (b)  $\ln e^{\sqrt{2}}$   
 (a) \_\_\_\_\_  
 (b) \_\_\_\_\_

**15.(1 pt)**

Find the exact value of each expression.

- (a)  $2^{\log_2 3 + \log_2 5}$   
(b)  $e^{3 \ln 2}$   
(a) \_\_\_\_\_  
(b) \_\_\_\_\_

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**16.**(1 pt)

Express the given quantity as a single logarithm.

$$2 \ln 4 - \ln 2$$

\_\_\_\_\_

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**17.**(1 pt)

Express the given quantity as a single logarithm.

$$\ln x + 6 \ln y - 5 \ln z$$

\_\_\_\_\_

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**18.**(1 pt)

Solve each equation for  $x$ .

(a)  $5 \ln x = 1$

(b)  $e^{-x} = 9$

(a) \_\_\_\_\_

(b) \_\_\_\_\_

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**19.**(1 pt)

Solve each equation for  $x$ .

(a)  $e^{2x+3} = 2$

(b)  $\ln(5 - 2x) = -9$

(a) \_\_\_\_\_

(b) \_\_\_\_\_

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**20.**(1 pt)

Solve each equation for  $x$ .

(a)  $\ln(\ln x) = 1$

(b)  $e^{8x} = 7e^{-x}$

(a) \_\_\_\_\_

(b) \_\_\_\_\_

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**21.**(1 pt)

If a ball is thrown into the air with a velocity of 40 ft/s, its height in feet after  $t$  seconds is given by  $y = 40t - 16t^2$ .

(a) Find the average velocity for the time period beginning with  $t = 2$ :

- (1) .5 second  
(2) .1 second  
(3) .05 second  
(4) .01 second

(b) Find the instantaneous velocity when  $t = 2$ .

- (1) \_\_\_\_\_ ft/s  
(2) \_\_\_\_\_ ft/s  
(3) \_\_\_\_\_ ft/s  
(4) \_\_\_\_\_ ft/s  
(b) \_\_\_\_\_ ft/s

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**22.**(1 pt)

The position of a car is given by the values in the table.

$t$ (seconds)	0	1	2	3	4	5
$s$ (feet)	0	10	32	70	119	178

Find the average velocity for the time period beginning when  $t = 2$  and lasting

- (1) 3 seconds, (2) 2 seconds, (3) 1 second

(Using the graph, one can estimate the instantaneous velocity when  $t = 2$  to be about 28 ft/s.)

- (1) \_\_\_\_\_ ft/s  
(2) \_\_\_\_\_ ft/s  
(3) \_\_\_\_\_ ft/s