

**WeBWork Assignment Homework06 is due : 05/21/2016 at 04:08pm EDT.**

**Reference:** Axler, Precalculus, 2nd ed, Sections 3.5 and 3.7

Here's the list of **functions and symbols** that WeBWork understands.

1. (1 pt) Use logarithms to find an exact solution to the equation below.

$$e^{0.08t} = 11$$

$$t = \underline{\hspace{2cm}}$$

2. (1 pt) Find the exact solution to the equation below. (Do not give a decimal approximation.)

$$3\ln(2x+2) = 20$$

$$x = \underline{\hspace{2cm}}$$

3. (1 pt) Convert the exponential equation  $Q = 0.1e^{0.3t}$  to the form  $Q = ab^t$  and enter the values of  $a$  and  $b$  below.

$$a = \underline{\hspace{1cm}}$$

$$b = \underline{\hspace{1cm}}$$

4. (1 pt)

Without a calculator, match each function with its graph.

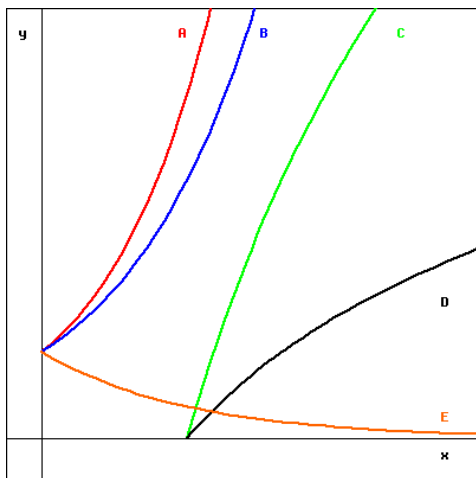
$y = \log(x)$

$y = 2^x$

$y = \ln(x)$

$y = 5^x$

$y = e^{-4x}$



(Click on graph to enlarge)

5. (1 pt)

Solve each of the following equations for  $x$ .

$$\ln(8x+4) = 2$$

$$x = \underline{\hspace{2cm}}$$

$$\ln(8x^3) = \ln(5x) + 5$$

$$x = \underline{\hspace{2cm}}$$

6. (1 pt)

Solve each of the following equations. If there are multiple solutions, enter them as a comma separated list. If there are no solutions, enter "None".

$$\ln(x+1) - \ln(x-5) = 5.$$

$$x = \underline{\hspace{2cm}}$$

$$\ln(x-5) - \ln(x+1) = 5$$

$$x = \underline{\hspace{2cm}}$$

$$\ln(x) + \ln(x+1) = 5$$

$$x = \underline{\hspace{2cm}}$$

7. (1 pt)

Solve each of the following equations. If there are multiple solutions, enter them as a comma separated list. If there are no solutions, enter "None".

$$e^{2x} = 5e^x - 5$$

$$x = \underline{\hspace{2cm}}$$

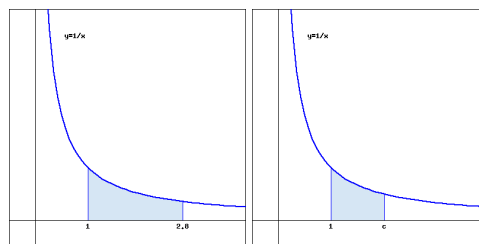
$$e^{2x} = -5e^x - 5$$

$$x = \underline{\hspace{2cm}}$$

$$e^{2x} = 5e^x + 5$$

$$x = \underline{\hspace{2cm}}$$

8. (1 pt)



Find the area of the shaded region in the graph on the left above. You can see a bigger version by clicking on the image.

Area =  $\underline{\hspace{1cm}}$  square units

The area of the shaded region on the right is exactly 0.7 square units. Find the  $x$  coordinate  $c$  of the right edge of the region.

$$c = \underline{\hspace{2cm}}$$

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**9.** (1 pt) A population is 15000 in year  $t = 0$  and grows at a continuous rate of 7.3% per year.

(a) Find a formula for  $P(t)$ , the population in year  $t$ .

$$P(t) = \underline{\hspace{2cm}}$$

(b) By what percent does the population increase each year?  
 $\underline{\hspace{2cm}}$  % (round to 0.001%)

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**10.** (1 pt) A population shrinks from its initial level of 19,000 at a continuous decay rate of 5.5% per year.

(a) Find a formula for  $P(t)$ , the population in  $t$  years.

$$P(t) = \underline{\hspace{2cm}}$$

(b) By what percent does the population shrink each year?  
 $\underline{\hspace{2cm}}$  % (Round to the nearest 0.001%)

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**11.** (1 pt) In 2004 the gross world product,  $W$ , (total output in goods and services) was 54.7 trillion dollars and growing at a continuous rate of 3.8% per year.

(a) Write a formula for  $W$ , the GWP (in trillions of dollars), as a function of years,  $t$ , since 2004.

$$W(t) = \underline{\hspace{2cm}}$$

(b) Estimate the value of  $t$  when the GWP is predicted to reach 95 trillion dollars.

$$t = \underline{\hspace{2cm}} \text{ (Round to the nearest 0.1 years.)}$$

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**12.** (1 pt) The voltage  $V$  across a charged capacitor is given by  $V(t) = 5e^{-0.6t}$  where  $t$  is in seconds.

(a) What is the voltage after 5 seconds?  $\underline{\hspace{2cm}}$  volts (round to the nearest 0.001 volts)

(b) When will the voltage be 1? In  $\underline{\hspace{2cm}}$  seconds (round to the nearest 0.01 sec.)

(c) By what percent does the voltage decrease each second?  
 $\underline{\hspace{2cm}}$  % (round to the nearest 0.001%)

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**13.** (1 pt) You deposit \$4000 into an account that earns 7% compounded annually. A friend deposits \$3500 into an account that earns 6.95% annual interest, compounded continuously. Will your friend's balance ever equal yours? If so, when? If not, enter *NEVER*.

They will be equal in about  $\underline{\hspace{2cm}}$  years (round to nearest whole year).