**Notes**

1. The population of a town in 2001 was 1000. The population doubles every year.
	1. Construct an equation that describes the population, *P,* as a function of the number of years after 2001, *t*. Use function notation.
	2. According to the model, what will the population be in 2006?
	3. When will the population reach 8,000?
	4. When will the population reach 12,000?

**Vocabulary:**

Logarithm

* Base 10:
* Base *e*:
1. Determine the value of ***y*** by using the definition of a logarithm. Do NOT use a calculator.
	1. 
	2. 
	3. 
	4. 
2. Rewrite the following logarithmic equations into exponential form and then solve for *t*. Round answers to **3 decimals**.
	1. 
	2. 

**Rule of Common Logarithms and Natural Logarithms**

1. Using a calculator, complete the following table.

|  |  |  |
| --- | --- | --- |
| **x** | **y = log (x2)** | **y = 2∙log(x)** |
| 1 |  |  |
| 2 |  |  |
| 3 |  |  |
| 4 |  |  |

**Conclusion:**

= \_\_\_\_\_\_\_\_\_\_\_\_\_

= \_\_\_\_\_\_\_\_\_\_\_\_\_

1. Using what you found in the previous question, rewrite the following expressions:

$=\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_$

$=\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_$
$=\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_$

1. Answer #1d with using logarithms.
2. Solve the following equations for *t.* Round answers to 3 decimal places.
	1. 
	2. 
3. Maria’s parents decided to invest $5000 in an account that earns interest at a rate of 7.5% compounded continuously.
4. Construct an equation that describes the value of the investment after *t*years.
5. Determine when Maria will have $40,000 in the account.