

# Worksheet #5 - Future and Present Value

January 27, 2006

Remember some of the rules for using exponentials.

$$\ln(A \cdot B) = \ln(A) + \ln(B)$$

$$\ln(A^p) = p \cdot \ln(A)$$

Problem #1:

- Use your calculator to fill in the chart. Use four-decimal places in your calculations.

x	$\ln(x)$
1	
2	
3	
5	
10	
15	
30	

- What is the value of  $\ln(2) + \ln(5)$  ? Is it  $\ln(7)$  ?
  
- What is the value of  $\ln(2) + \ln(3) + \ln(5)$  ? Is it  $\ln(10)$  ?
  
- What is the value of  $\ln(30) - \ln(2)$  ? Is it  $\ln(28)$  ?

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Future and Present Value of Money is an important application of exponential functions. Know how to build a table to keep the different values and years organized when doing these problems. The basic formulas that you will be using are:

$$F = P(1 + r)^t$$

$$F = P \cdot e^{rt}$$

Problem #2:

- How much is \$300 worth in 10 years if it can grow at 5.5% per year?
  
- How much is \$300 in 10 years worth today if it can grow at 5.5% per year?
  
- How much is \$8000 in 20 years if it can grow at 6.25% per year? How much is \$8000 in 20 years if it can grow at a continuous annual rate of 6.25%?
  
- If the growth rate of money is 4% annually, how much is receiving three separate payments of \$500 after 5 years, after 10 years, and after 15 years worth in today's dollars ?
  
- If the growth rate of money is 4% annually, how much is receiving three separate payments of \$500 in 8 years, \$1000 in 10 years, and \$1500 in 12 years worth in today's dollars ?