

Below is a selection of problems related to section 1.5. These problems will not be collected or graded. However, you should understand how to work each of these problems. You should begin working on these problems in groups in recitation. You will probably want to finish these problems outside of class. If you have questions, please ask your TA or instructor. If you find a problem difficult, consider working similar problems from the text for additional practice.

1. Work the following problems from Stewart, section 1.5. #1, 3, 7, 9, 15, 16, 20, 23, 24.
2. Solve the following equations. Hint: You should be able to work these in your head—don't use a calculator.
 - (a) $2^x = 4$
 - (b) $a^x = a$ (Assume that $a > 0$.)
 - (c) $a^x = 1$
 - (d) $4^x = 2$
 - (e) $8^x = 4$
 - (f) $4^x = 8$
3. Suppose that you are extremely lucky and find a bank that pays 100% interest. If this is simple interest, then you deposit \$1 and at the end of the year, you receive your \$1 in principal and \$1 in interest for a total of \$2. If the interest is compounded twice a year, your account is contains $(1 + 1/2)^2 = \$2.25$ at the end of the year.
 - (a) Suppose that interest is compounded 4 times a year, what is the value of your account at the end of the year?
 - (b) Write a formula which gives the value of the count if the interest is compounded n times a year? Check your formula against the case $n = 1, 2, 4$ considered above.
 - (c) Use your answer to the previous part to complete the following table:

Number of compounding periods	1	2	4	100	1,000	100,000
Value of account	2	2.25				

What happens to the account as the number of compounding periods increases?
 - (d) Suppose now that we have a more reasonable interest of 10%. What is the value of your account after 1 year if you pay interest twice a year? What if you pay interest 100,000 times a year?

4. Are all exponential functions the “same”? More precisely, can you obtain the graph of $f(x) = a^x$ from the graph of $g(x) = e^x$, by a vertical stretching? By a horizontal stretching? Does it matter if $a > 1$ or if $0 < a < 1$?