

Name: \_\_\_\_\_

**Preview: Chapter 1: The Measurement of Interest**

*Directions: Print out and complete, based on your reading of the text. If there are multiple sheets, staple together the top left corners (in the correct order). Turn in at the start of class on the date due. Do not submit answers on notebook paper or via email. No credit for late or incomplete preview assignments. Assignments may be turned in, in advance, to my mailbox in 233 MSB.*

**§1.5: Compound interest**

1. Define

(a) compound interest

2. Read the first paragraph on page 9.

(a) What can be considered the principal at the beginning of the fourth period?

(b) What is the balance at the end of the fourth period? *Show why.*

(c) Give a formula for the accumulation function for compound interest.

(d) Explain the derivation of this formula to your roommate, sister, boyfriend, grandmother, etc. How long did it take until s/he understood?

3. A constant rate of compound interest implies a \_\_\_\_\_ effective rate of interest. In fact, under compound interest,  $i_n = \underline{\quad}$  for all  $n$ .4. Sketch a graph of  $a(t)$  (for  $t > 0$ ) if interest is accrued according to compound interest over fractional periods as well as integral periods.

5. Suppose Bank ABC offers a savings account with simple interest at 5% annually, while Bank XYZ offers an account with compound interest at 5% annually.
- (a) If you wanted to invest \$1000 for 3 months, which bank should you choose? Why?
- (b) If you wanted to invest \$1000 for 1 year, which bank should you choose? Why?
- (c) If you wanted to invest \$1000 for 2 years, which bank should you choose? Why?
6. (a) Under simple interest, it is the \_\_\_\_\_ of growth that is constant over equal periods of time.
- (b) Under compound interest, it is the \_\_\_\_\_ of growth that is constant over equal periods of time.
7. (a) Under simple interest, it is \_\_\_\_\_ that is independent of  $t$ .
- (b) Under compound interest, it is \_\_\_\_\_ that is independent of  $t$ .
8. Read Example 1.4 (which is Example 1.3 reworked with compound interest). Assume that the investor leaves the money in the account for another two years, for a total of six years. Find  $A(6)$ ,  $I_6$ , and  $i_6$ .



10. Read Example 1.6. Find the accumulated value of \$2000 at the end of 10 years 7 months invested at 6% per annum  
(a) assuming compound interest throughout.

(b) assuming compound interest for whole years and simple interest during the final fractional period.

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**Appendix 1: Compound interest for fractional periods**

1. A more rigorous development of compound interest starts with what property that we want compound interest to possess?
2. Explain this formula in words (complete sentences).