

DO NOT TURN THIS PAGE UNTIL YOU ARE INSTRUCTED TO DO SO

- ❖ Write your name below on the space provided.
- ❖ This test has a total of 5 pages.
- ❖ Work the problem in the space provided. If you need more space, write on the back of the test.
- ❖ To insure maximum credit, show your work. In general, full credit will not be given for unsupported answers.
- ❖ Look only at your test. Don't give me the impression that you are cheating.
- ❖ Be sure to write neatly. If I cannot read what was written, do not expect the problem to be graded.
- ❖ If you finish early, go over the test again.

Good luck!

Number	Maximum	Score
1	6	
2	6	
3	6	
4	6	
5	24	
6	8	
7	12	
8	18	
9	11	
10	3	
Total	100	

Name \_\_\_\_\_

**CIRCLE FINAL ANSWERS**  
**Round to Two Decimal Places**  
**Unless Otherwise Noted**



- 5) (6 points each) Atrus borrowed \$145,000 for a home on a 30-year loan that carried a 6.75% annual interest rate compounded monthly. After 8 years, he was able to refinance down to a 15-year loan that carried a 3.25% annual interest rate compounded monthly.
- a) Determine the monthly payment for the beginning 30-year loan:      b) How much was left on the balance after paying for 8 years?

- c) Determine the monthly payment for the new 15-year loan:      d) How much money did Atrus save by refinancing his mortgage?

- 6) (8 points) Kondor takes out a loan of \$100,000 for a condo. Her loan has a 4.5% annual interest rate compounded monthly for 15 years. Chart the first two months of the loan given the monthly mortgage payment is \$770.00. **Be sure to show the numbers that are being multiplied and subtracted. Round to two decimal places as you work:**

End of Month	Interest	Principal	Balance
1			
2			

- 7) (6 points each) Schmidt works out that he would need \$4,000 a month during his retired years. He is currently 25 years old and plans to work until his is 65. He assumes that he would need to make withdraws for 30 years past his retirement and that he's in a 25% tax bracket. Assuming he finds an account that will offer him a 6.25% annual interest rate compounded monthly...
- a) How much should he have in his account at retirement?      b) How much should he deposit monthly during his working years to ensure he meets his goal?

8) Balthier is 30 years old and is working as a local sky pirate. He is able to deposit \$525 a month into a Pirate Bank 401-k which offers a 7.25% annual interest rate. He does this for 30 years. After that time, he will retire. He wishes, over the next 25 years, to take out equal withdraws until the account is emptied. Assume the interest rate is the same after retirement.

- a) (12 points) What are the equal withdraws he is able to take out?      b) (2 points) How much did he deposit before retirement?

- c) (2 points) How much did he withdraw after retirement?      d) (2 points) How much interest did he earn overall?

9) Mike goes game-shopping several times during the month of November. His PlayStation credit card has a \$0 balance as of November 1.

a) (8 points) Based on the purchases below, fill in the last column of the table and determine the average daily balance for the account.

Day of Purchase	Game Purchased	Purchase Price	Daily Balance
November 1	Uncharted 4	\$59.00	
November 12	Rock Band 4 Bundle	\$249.00	
November 19	The Talos Principle	\$49.00	
November 22	Battleborn Deluxe	\$79.00	

b) (3 points) Assuming there is a 16.75% annual finance charge on the card and that Mike made no payment on the card, what will be the finance charge for the month of November? Use the  $I=Prt$  formula where  $t$  is the number of days in cycle divided by 365.

10) (3 points) What is the **major theoretical** distinction between Compound Interest and Future Value of an Annuity?

# Chapter 1 Formulas

Simple Interest:  $I = Prt$

Amount of Simple Interest:  $A = P + Prt = P(1 + rt)$

Compound Interest:  $A = P\left(1 + \frac{r}{n}\right)^{nt}$

Present Value:  $P = A\left(1 + \frac{r}{n}\right)^{-nt}$

Annual Percentage Yield:  $APY = \left(1 + \frac{r}{n}\right)^n - 1$

Amortization:  $PMT = \frac{PV\left(\frac{r}{n}\right)}{\left(1 - \left(1 + \frac{r}{n}\right)^{-nt}\right)}$

Amount Owed on a Loan:  $A\left(1 + \frac{r}{n}\right)^{nt} - \frac{PMT\left(\left(1 + \frac{r}{n}\right)^{nt} - 1\right)}{\left(\frac{r}{n}\right)}$

Average Daily Balance:  $ADB = \frac{(\text{number of days})(\text{beginning balance}) + (\text{number of days})(\text{new balance}) + \dots}{\text{total number of days}}$

Present Value of an Annuity:  $PV = \frac{PMT\left(1 - \left(1 + \frac{r}{n}\right)^{-nt}\right)}{\left(\frac{r}{n}\right)}$

Future Value of an Annuity:  $FV = \frac{PMT\left(\left(1 + \frac{r}{n}\right)^{nt} - 1\right)}{\left(\frac{r}{n}\right)}$

Sinking Fund:  $PMT = \frac{FV\left(\frac{r}{n}\right)}{\left(\left(1 + \frac{r}{n}\right)^{nt} - 1\right)}$