

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. Feel free to tear off the last page. I do not need it returned.
- ❖ Work the problem in the space provided. If you need more space, write on the back of the test. Be sure to mark on the test that work is continued on the back. Be sure to number your work.
- ❖ To insure maximum credit, show your work. In general, full credit will not be given for unsupported answers.
- ❖ Look only at your test.
- ❖ Be sure to write neatly and in pencil. If I cannot read what was written or it is not in pencil, 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 Only the Final Answer  
to Two Decimal Places Unless Otherwise Noted

- 1) (6 points) Dario invests \$540 into an account that offers a 1.79% simple annual interest rate for 8 years. How much is in the account after that time and how much interest was earned?
  
  
  
  
  
  
  
  
  
  
- 2) (6 points) Setting up a 529 plan for his son, Matthew puts away \$8,950 into the account as a lump sum. The account carries a 5.85% interest rate compounded monthly. How much money will be in the account after 18 years and how much interest did he earn?
  
  
  
  
  
  
  
  
  
  
- 3) (6 points) How much should be invested now so that in 12 years there will be \$7,000 in an account that offers a 2.35% annual interest rate compounded quarterly?
  
  
  
  
  
  
  
  
  
  
- 4) (6 points) Which is a better way to invest? Option A: 5.2% compounded semi-annually or Option B: 5.1% compounded monthly? **Write answer as a percent rounded to three decimal places.**

5) (6 points each) Sabrina borrowed \$123,000 for a home on a 30-year loan that carried a 6.75% annual interest rate compounded monthly. After 7 years, she was able to refinance down to a 15-year loan that carried a 3.15% 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 7 years?

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

6) (8 points) Nicole takes out a loan of \$175,000 for a condo. Her loan has a 4.12% annual interest rate compounded monthly for 30 years. Chart the first two months of the loan given the monthly mortgage payment is \$847.63. **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 \$5,000 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) Isaac, who is 24 years old, starts his career and opens up a 401k where he deposits \$450 every month. He plans to work until he is 64 years old. During retirement, he would like to take out equal payments over the next 25 years. Assuming the account carries a 6.30% annual interest rate compounded monthly for the entire length of the account, determine the following.

- a) (12 points) What are the equal withdraws he is able to take out?      b) (2 points) How much total did he deposit during his working years?

- c) (2 points) How much total 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 March. His LuvyDuvy® credit card has a \$0 balance as of March 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	Item Purchased	Purchase Price	Daily Balance
March 1	Leftover Valentine's Day Candy	\$39.00	
March 12	More Valentine's Day Candy	\$253.00	
March 19	Pepto Bismol	\$79.00	
March 23	Gym Membership	\$310.00	

b) (3 points) Assuming there is a 14.75% 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 March? 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:  $A\left(1 + \frac{r}{n}\right)^{nt} - \frac{PMT\left(\left(1 + \frac{r}{n}\right)^{nt} - 1\right)}{\left(\frac{r}{n}\right)}$

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

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