

**MAT 108: Exam 1**  
**Spring — 2024**  
**02/19/2023**  
**85 Minutes**

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

Write your name on the appropriate line on the exam cover sheet. This exam contains 8 pages (including this cover page) and 7 questions. Check that you have every page of the exam. Answer the questions in the spaces provided on the question sheets. Be sure to answer every part of each question and show all your work. If you run out of room for an answer, continue on the back of the page — being sure to indicate the problem number.

Question	Points	Score
1	15	
2	13	
3	15	
4	15	
5	12	
6	15	
7	15	
Total:	100	

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1. (15 points) Buddy Wieser just sold the exclusive rights to his homemade mead for \$172,000. Wanting to make the most of this windfall, he places the money into an account that earns 5.30% annual interest, compounded monthly.
  - (a) How much will the account have after 7 years?
  - (b) What is the nominal interest?
  - (c) What is the actual annual interest rate that his money earns?

2. (13 points) Eaton Wright is trying to understand the rising costs of his Chipotle burritos. He takes a look at the state of the US economy. As of January 2024, the current CPI in the US is 309.68—up from 308.74 in December 2023.
- (a) What was the percentage change in the US CPI from December 2023 to January 2024?
  - (b) If the CPI continues to increase monthly from January 2024 at the rate found in (a), what percentage more would one anticipate goods will cost in January 2030?
  - (c) If Eaton's Chipotle order costs \$18.93 now, according to (b), what should he estimate his meal's cost to be in January 2030?

3. (15 points) Robert Burger runs a small restaurant with his wife and three children. He sells his burger of the day for \$5.95 each. Though each special burger is different, he estimates that on average each costs \$3.89 for him to make. He pays a total of \$3,947 in rent each month to operate the business. Find the minimum number of specials Bob needs to make and sell each month to turn a profit.

4. (15 points) Reid Enright is saving money from his job as a school teacher to travel to the Pacific Northwest to pursue his passion—hunting for Bigfoot. After work on the first of each month, he places \$338 into an account which earns 2.08% annual interest, compounded quarterly. Once Reid retires in another 20 years, how much will he have saved for his adventure?

5. (12 points) Rose Budd  is recently retired and realizes that the last time she was truly happy was while she was living in a small estate called Sanadont in the Florida panhandle. Luckily, the home is currently on the market. Using her retirement savings, she needs just under an additional \$14,000 to purchase the home. Rose takes out a simple discount note for the money at 11.3% annual interest for a period of 8 months.
- (a) How much does she receive from the bank?
  - (b) What is the interest she will pay on this loan?
  - (c) What does she owe the bank when the loan comes due in 8 months?

6. (15 points) Nita Cash is the daughter of legendary singer Johnny Cash's father's, brother's, nephew's, cousin's, former roommate. She would like to open a museum to honor her close connection to the famous singer. She takes out a loan of \$280,000 at 5.65% annual interest, compounded monthly for a period of 25 years, which will be repaid with equal, end of the month payments.
- (a) What are Nita's monthly payments?
  - (b) How much interest does she pay in total?
  - (c) How much does she pay on the loan in total?

7. (15 points) Nye Tommy Gunne is saving to finance his indie film *Home Together: Found in Staten Island*. He wants to save \$85,000 for the film by placing \$45,000 into an account that earns 4.09% annual interest, compounded continuously. How long until he has saved enough for his film?