

MAT 126: Practice Midterm

Lehman College CUNY

Instructions: To prepare for the upcoming exam, answer all of the problems below. Show all of your work. You are allowed to use a scientific calculator, the reference sheet provided, and two pages of prepared notes.

Problems.

1. What was the net inflation rate from 1980 to 1990?
2. (a) What is 18 percent of 1776?
(b) What percent of 1776 is 18?
3. The population of West Oblivion grew from 4740 in 1980 to 6260 in 2000. Calculate the absolute change in the population and the percent change in the population.
4. In 2000, your salary increased by 20%. In 2001, you received a 20% pay cut. After the two changes, how does your salary compare to your original salary? Is it higher, lower, or unchanged? Fully explain your answer.
5. (a) In 2008, the average salary of a Mathematician in the USA was \$95,000. Use the CPI to estimate the average salary of a Mathematician in the USA in 1999.
(b) The actual average salary of a Mathematician in the USA in 1999 was \$67,970. How does your estimate compare to this amount?
6. Worldwide there are approximately 132 million births per year. Express this quantity in births per hour.
7. A suit costs \$450 before an 8% sales tax. How much is the cost after tax is added?
8. Maria deposits \$350 into a bank that gives an annual interest rate of 2%. Calculate the amount of money she has in her account after 4 years assuming that:
 - (a) the bank applies simple interest.
 - (b) the bank applies compound interest once a year.
9. A home owner charges his tenant \$1500 a month for rent. Next year, the home owner is going to charge the same tenant \$1525. Naturally, the tenant is complaining about the increase in rent. Assuming that the Consumer Price Index is expected to rise by 3% over the next year, defend the home owner's raise in the rent as a "good deal" for the tenant.
10. Felicia's current refrigerator costs approximately \$20 a month in electricity to run. A new energy efficient refrigerator costs \$1200 to purchase, but only costs \$6.50 a month in electricity to run. After approximately how many months does the energy efficient refrigerator pay for itself? Fully explain how you arrived at your answer.

11. The following table gives the results of two clinical treatments of people with cancer. The information is broken down for two groups: those with active cancer and those with cancer in remission.

Treatment Type	Active Cancer		Cancer In Remission	
	Died	Survived	Died	Survived
TREATMENT A	22	578	4	296
TREATMENT B	4	96	4	196

- (a) For people with active cancer, find the percentage of those that died using Treatment A and the percentage of those that died using Treatment B?
- (b) For people with cancer in remission, find the percentage of those that died using Treatment A and the percentage of those that died using Treatment B?
- (c) For people with cancer (both active and in remission), find the percentage of those that died using Treatment A and the percentage of those that died using Treatment B?
- (d) Explain how this is an example of Simpson's Paradox.

MAT 126: Practice Final

Lehman College, CUNY

Instructions: To prepare for the upcoming exam, answer all of the problems below. Show all of your work. You are allowed to use a scientific calculator, the reference sheet provided, and two pages of prepared notes.

Problems.

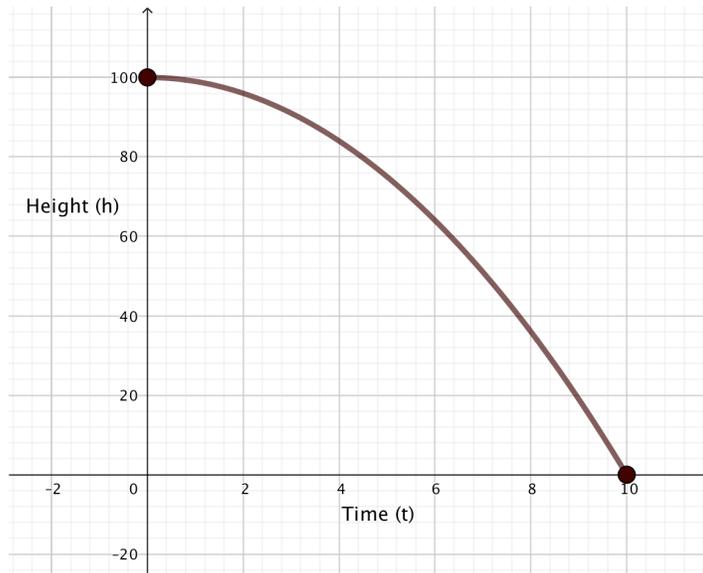
- Telenext is conducting a study to determine which cell phone carrier offers the cheapest data rates.
 - Classify this as an experimental or observational study. Explain.
 - Do you believe it is best for Telenext to collect quantitative or qualitative data for this study? Explain.
- Ten homeowners in Greensville, PA were asked how many times in a summer week they water their lawn. The responses were as follows:
4 2 4 6 7 5 3 4 5 4
Calculate the mean, median, and mode of this data set.
- Fausto deposits \$1800 into a bank account that offers an annual interest rate of 3.6%.
 - Find Fausto's bank balance after 5 years if interest is compounded one time per year?
 - Find Fausto's bank balance after 5 years if interest is compounded quarterly (four times per year)?
- Jorge saves money for 10 years in order to buy a car. Assume that his investment plan pays an APR of 6% compounded monthly.
 - If Jorge saves \$50 monthly, then how much money will he have to spend on his car?
 - How much money will Jorge have to borrow from his parents if he wishes to buy a car valued at \$12,000?
- Consider the following statements. In each case, state the correlation clearly. Identify the variables correlated and express the correlation as positive or negative.
 - The higher the temperature, the more sunscreen is purchased.
 - The longer a movie, the less people view it.
 - The less time students spend studying, the lower their final grade.
- The half-life of a radioactive substance is 40 years and you start with 2mg of this substance. How much is present after 80 years? 160 years?

More Problems On Back

7. For private parties, The Palms Plaza charges a \$500 fixed cost for renting the room plus an additional \$55 per person. These prices include all taxes and gratuities.
- How much does it cost to host a party of 45 people?
 - Write a linear function to describe the situation. Clearly identify all variables used.
 - Last night, the Palms Plaza collected \$3800 from a party. How many guests were served?
8. Consider the following statements:
- Gary's monthly rent rate increases by 4% every year.
 - Each year, Sal's Social Club loses 3 members.
 - The ant population in Bugaboo Township doubles every year.

Identify the growth/decay in each scenario as either linear or exponential. Explain your reasoning.

9. The graph below shows the height h in feet of a falling object after t seconds. Use this graph to answer the questions that follow.



- Estimate the height of the object after 4 seconds.
- What was the initial height of the object? Explain your reasoning.
- After how many seconds does the object hit the ground? Explain your reasoning.