

Name _____

Quiz 2

MATH 101-06 Math in the Modern World

Fall 2009

Instructions: Answer the following questions. Explain your work and reasoning to receive full credit.

1.

a. Find a set of 10 numbers whose mean is 50 and whose median is 60.

There are many possible solutions. One is: 20, 40, 40, 40, 60, 60, 60, 60, 60, 60

b. What two numbers could you add to your set that would raise the mean but lower the median?

To raise the mean, you need to add numbers greater than 50. To lower the median you need to add numbers lower than 60. So any two numbers between 50 and 60 would work. For example: 51,55.

2. Explain why you wouldn't want to use the mean income to characterize the income level in a city.

Just a few people with very high incomes could end up greatly exaggerating the mean (average). The median would be a much better representation of the standard income level for a city.

3. The average cost of a pound of navel oranges in the U.S. in January of 1980 was \$0.38. Using 1980 as a base year (reference year), fill in the **three** blanks in the following table of cost-of-oranges index (COI) values.

Year	Cost of Oranges	COI
1980	\$ 0.38	100
1990	\$ 0.50	131.6
2000	\$ 0.61	160.5
2005	\$0.94	247

4. Your friend is planning a move from Phoenix, AZ to Chicago, IL. She is currently earning an annual salary of \$43,700 in Phoenix. Using the fact that the Cost of Living Index for Phoenix is 97.2 and Chicago's is 130, what would be a comparable salary in Chicago?

The COL index increases by 33.74%, so the salary should also. This results in a salary of \$58,446.50. If the percent increase was rounded to 34% the resulting salary would be \$58,558. Either of these two answers would be fine.

5. Recall that the Consumer Price Index (CPI) is a measure of the average change over time in the prices paid for basic goods and services. It has a base of 100 for a reference year of about 1983.
- a. If the CPI for 2007 was 206, what does this tell you about the cost of basic goods and services in 2007 compared with 1983? *Your response should be one or two complete sentences. Take care to state your comparison using correct language.*

Since the CPI basically doubled, this means that the cost for basic goods and services also about doubled during this time period. More precisely, the cost for goods and services increased by 106%.

- b. *Fill in the blank:* If the CPI for 2005 was 191, \$1 in 2005 would have the same buying power as \$_____ in 2007.

The CPI increased from 191 to 206 during this time period. This is an increase of about 7.9%. If you increase \$1 by 7.9% (and round to the nearest cent) you get **\$1.08**. So what used to cost \$1 in 2005, costs \$1.08 in 2007.

6. If 3.2% of the GDP is \$448 billion, express the GDP in trillions of dollars.

Since $0.032(GDP) = \$448$ billion, the GDP is 14,000 billion. This is the same as 14 trillion.

7. If the price of some books together with 8% sales tax came to \$130, how much were the books before the tax was added?

If P stands for the price before tax, we're told that $1.08P = \$130$. This means that the price before tax was \$120.37.

CAREFUL: This is not the same as reducing \$130 by 8% (which is \$119.60).