Name _____

Date _____

# Quantitative Reasoning/Quantitative Literacy
# Assessment Instrument

**Directions: The Quantitative Literacy (QL)/Quantitative Reasoning (QR) Project at the City University of New York (CUNY) is currently in the process of implementing new teaching strategies to strengthen students' quantitative reasoning skills. As part of this effort, we are trying to measure students' attitudes and QL/QR skills. The questions in this assessment instrument are part of this effort. This exercise will not be used in grading your performance in this class and you may refuse participation or skip any questions that you do not wish to answer. At the same time, we ask that you please try your best to respond to all the questions since your responses are very important to this research and will be treated with great respect and confidentiality. Thank you very much for your participation in this exercise!**

*Quantitative Reasoning or Quantitative Literacy may be thought of as "a 'habit of mind,' competency, and comfort in working with numerical data. Individuals with strong QL skills possess the ability to reason and solve quantitative problems from a wide array of authentic contexts and everyday life situations. They understand and can create sophisticated arguments supported by quantitative evidence, and they can clearly communicate those arguments in a variety of formats (using words, tables, graphs, mathematical equations, etc., as appropriate)"* (Association of American Colleges and Universities 2010).

1. **What is the name of the course (or code) where you are filling out this questionnaire?**

_____

2. **What is the section (or meeting time) of the course?**

_____

3. **How many college courses are you currently taking this summer?**

   a. ○ 1-2 classes
   b. ○ 3-4 classes
   c. ○ 5 or more classes

4. **What is your sex?**

   a. ○ Male
   b. ○ Female

5. **What is your current age?**

_____

6. **Did you transfer to Lehman?**

   a. ○ No
   b. ○ Yes, from a community college
   c. ○ Yes, from another college (but not a community college)

7. **Please indicate the <u>single</u> race or ethnicity that you most closely identify with:**

   a. ○ White/Caucasian
   b. ○ Black/African American
   c. ○ Indian/Native American
   d. ○ Asian or Pacific Islander
   e. ○ Hispanic/Latino/Latina

8. **Were you born in the United States?**

   a. ○ Yes (please go to Q #9)
   b. ○ No (please answer Q #8a)

   **8a. What country were your born in?**

_____

9. **Is English your first language?**

   a. ○ Yes (please go to Q #10)
   b. ○ No (please go to Q #9a)

   **9a. What is your first language?**

_____

10. **What is your current status at Lehman?**

   a. ○ Freshman (30 or fewer credits)
   b. ○ Sophomore (31 to 60 credits
   c. ○ Junior (61 to 90 credits)
   d. ○ Senior (91 to 120 credits)
   e. ○ Graduate Student
   f. ○ Other

11. **What is (are) your majors(s)? If undecided, please indicate below.**

_____

_____

12. **What is (are) your minor(s)? If undecided or none, please indicate below.**

_____

_____

13. **Where did you attend high school? (Please check all that apply.)**

   a. ○ Public high school in NYC, Yonkers or Mount Vernon
   b. ○ Specialized public high school in NYC (Bronx Science, Brooklyn Poly, etc.)
   c. ○ Public high school outside NYC/Yonkers/ Mount Vernon
   d. ○ Private or parochial high school in US
   e. ○ High school outside of US
   f. ○ Earned a GED

14. **What was your average grade in high school? (If you don't know, please provide an estimate.)**

_____

15. **What was your average grade in high school mathematics classes? (If you don't know, please provide an estimate.)**

_____

16. **What is your current Grade Point Average (GPA)? If you don't know, please provide an estimate. If this is your first semester at Lehman, please write "No GPA".)**

_____

17. **Are you currentlyworking at a job for pay?**

   a. ○ No
   b. ○ Yes, less than 5 hours/week
   c. ○ Yes, 5-10 hours per week
   d. ○ Yes, more than 10 hours/week

18. **Are you currently caring for one or more children &/or adults for more than 10 hours per week (not including paid work)?**

   a. ○ No
   a. ○ Yes

19. **What is the total number of math courses or other courses you have taken with a very heavy quantitative focus? (If you don't know, please provide an estimate.)**

_____

**Instructions: For each of the following questions, please fill in one circle indicating your extent of agreement or disagreement ranging from 1 (disagree strongly) to 5 (agree strongly). If you are not in a position to comment on a particular question, please indicate "Don't Know or Not Applicable (DK or N/A)." Please refer to the cover page of this survey for a definition of "quantitative reasoning."**

| | | Disagree Strongly | | Neutral | | Agree Strongly | Don't Know or Not Applicable |
|---|---|---|---|---|---|---|---|
| a. | I enjoy mathematics and quantitative reasoning. | O 1 | O 2 | O 3 | O 4 | O 5 | O DK or N/A |
| b. | I am good at mathematics and quantitative reasoning. | O 1 | O 2 | O 3 | O 4 | O 5 | O DK or N/A |
| c. | I prefer classes that do not have any mathematics or quantitative elements. | O 1 | O 2 | O 3 | O 4 | O 5 | O DK or N/A |
| d. | Mathematics and quantitative reasoning are important for my career goals. | O 1 | O 2 | O 3 | O 4 | O 5 | O DK or N/A |
| e. | Mathematical and quantitative skills help me make intelligent decisions about my life. | O 1 | O 2 | O 3 | O 4 | O 5 | O DK or N/A |
| f. | I like exploring problems using real data and computers. | O 1 | O 2 | O 3 | O 4 | O 5 | O DK or N/A |
| g. | Mathematics and quantitative skills help me understand the world around me. | O 1 | O 2 | O 3 | O 4 | O 5 | O DK or N/A |
| h. | I want to study more mathematics or statistics. | O 1 | O 2 | O 3 | O 4 | O 5 | O DK or N/A |
| i. | I rarely encounter situations that require mathematical or quantitative skills outside of school. | O 1 | O 2 | O 3 | O 4 | O 5 | O DK or N/A |
| j. | I am nervous about learning mathematics and quantitative skills. | O 1 | O 2 | O 3 | O 4 | O 5 | O DK or N/A |
| k. | Strong mathematics and quantitative skills help students to do well in other classes. | O 1 | O 2 | O 3 | O 4 | O 5 | O DK or N/A |
| l. | There is nothing creative about mathematics or statistics; it's just about memorizing facts, rules and formulas. | O 1 | O 2 | O 3 | O 4 | O 5 | O DK or N/A |
| m. | Writing about mathematics and statistics makes it easier to learn. | O 1 | O 2 | O 3 | O 4 | O 5 | O DK or N/A |
| n. | Mathematics and quantitative skills are important in everyday life. | O 1 | O 2 | O 3 | O 4 | O 5 | O DK or N/A |
| o. | Mathematics and quantitative analysis are solitary activities, done by people in isolation. | O 1 | O 2 | O 3 | O 4 | O 5 | O DK or N/A |
| p. | For me, mathematics and quantitative analysis rarely involve exploration, investigation or experimentation. | O 1 | O 2 | O 3 | O 4 | O 5 | O DK or N/A |
| q. | Working in groups helps me learn mathematics and quantitative skills. | O 1 | O 2 | O 3 | O 4 | O 5 | O DK or N/A |
| r. | I have had sufficient coursework in mathematics and quantitative reasoning to enable me to succeed in my career goals. | O 1 | O 2 | O 3 | O 4 | O 5 | O DK or N/A |
| s. | I have had sufficient coursework in mathematics and quantitative reasoning to enable me to succeed in my personal goals. | O 1 | O 2 | O 3 | O 4 | O 5 | O DK or N/A |
| t. | I have the mathematical and quantitative skills needed to critically evaluate the media and current events. | O 1 | O 2 | O 3 | O 4 | O 5 | O DK or N/A |

Note:  Some of these questions have been adapted from the Dartmouth Mathematics Across the Curriculum Survey.

**Quantitative Reasoning (Pretest) Assessment Instrument**

**Instructions**:  This assessment instrument is designed to evaluate your ability to interpret quantitative data, including numbers and rates.  This assignment will NOT be graded but you are required to hand it in.   Please try your best!

Based on the data in Table 1 (attached page), please answer the following 2 questions.

(1)  Based on Table 1, please show how the traffic accident fatality rate was calculated for any single year (please set up the equation/calculation).

(2)  Based on the data in Table 1, in what year were people most likely to die from traffic accident fatalities?  What year were they least likely to die? Please both (a) identify the numbers that support your answer and (b) interpret the data (explain the numbers) to support your answer.

(3)  A newspaper article that is reporting on regional differences in accident fatalities notes the following:

Of all US states, Texas contributed the largest share of traffic accident fatalities in 2011.

Based on this statement, would you feel confident arguing that people in Texas were more likely to die from traffic accident fatalities compared to individuals in other states in 2011?  Why or why not?

Table 1
Traffic Accident Fatalities in the United States, 2001 to 2010

| Year | Accident Fatalities | Rate per 100,000 | Population (approx.) |
|------|---------------------|------------------|----------------------|
| 2001 | 42,196 | 14.8 | 284,969,000 |
| 2002 | 43,005 | 15.0 | 287,625,000 |
| 2003 | 42,884 | 14.8 | 290,108,000 |
| 2004 | 42,836 | 14.6 | 292,805,000 |
| 2005 | 43,510 | 14.7 | 295,517,000 |
| 2006 | 42,708 | 14.3 | 298,380,000 |
| 2007 | 41,259 | 13.7 | 301,231,000 |
| 2008 | 37,423 | 12.3 | 304,094,000 |
| 2009 | 33,883 | 11.1 | 306,772,000 |
| 2010 | 32,885 | 10.7 | 309,350,000 |

Source:  United States Department of Transportation National Highway Traffic Safety Administration 2012 (http://www-nrd.nhtsa.dot.gov/Pubs/811630.pdf)

**Name** _____

**Date** _____

### Quantitative Reasoning  (Posttest) Assessment Instrument

Instructions:  This assessment instrument is designed to evaluate your ability to interpret quantitative data, including numbers and rates.  This assignment will NOT be graded but you are required to hand it in.   Please try your best!

Drawing on the data in Table 1 (attached page), please answer the following 2 questions.

(1)  Based on Table 1, please show how the suicide rate was calculated among any single racial/ethnic group of your choice (please set up the equation/calculation).

(2)  Among adults ages 35-64, what ethnic/racial group exhibited the highest and what ethnic/racial group exhibited the lowest likelihood of committing suicide in 2011? Please both (a) identify the numbers that support your answer and (b) interpret the data (explain the numbers) to support your answer.

(3)  A newspaper article that is reporting on regional differences in suicide notes the following:

> In comparing US regions (Northeast, Midwest, South, and West), the data show that the South contributed the highest proportion of suicides in 2011.

Based on this statement, would you feel confident arguing that people in the south were more likely to commit suicide than those in other regions of the US in 2011?  Why or why not?

Table 1
Suicide among Adults Ages 35-64 in the United States,  2011

| Race/Ethnicity | Suicides, 2011 | Suicide Rate (per 100,000) | Population, 2011 |
|---|---|---|---|
| White | 18,848 | 22.3 | 84,520,179 |
| Black | 970 | 6.8 | 14,264,706 |
| Hispanic | 1,180 | 7.4 | 15,945,946 |
| Asian/Pacific Islander | 509 | 7.8 | 6,525,641 |
| American Indian/Alaskan Native | 171 | 18.5 | 924,324 |

Sources:  CDC 2013 (http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6217a1.htm).

**Scoring Rubric for Question #1**

(a) Did the student correctly set up the numerator/denominator correctly?

| No. | Yes. |
|---|---|
| 0 points. | 1 point. |

(b) Did the student correctly multiple by 100,000?

| No. | Yes. |
|---|---|
| 0 points. | 1 point. |

TOTAL (up to 2 points) _____

**Scoring Rubric for Question #2**

(a) Did the student correctly identify the highest rate and lower rate?

| No. | Yes. |
|---|---|
| 0 points. | 1 point. |

(b) Did the student correctly refer to the appropriate numbers?

| No. | Yes. |
|---|---|
| 0 points. | 1 point. |

(c) Did the student correctly interpret the rate?

| No. | Yes. |
|---|---|
| 0 points. | 1 point. |

TOTAL (up to 3 points) _____

**Scoring Rubric for Question #3**

(a) Did the student correctly indicate that s/he could not reach the conclusion based on the data?

| No. | Yes. |
|---|---|
| 0 points. | 1 point. |

(b) Did the student correctly indicate they would need a rate (however stated) in order to make this conclusion?

| No. | Yes. |
|---|---|
| 0 points. | 1 point. |

TOTAL (up to 2 points) _____

**TOTAL POINTS** (up to 7 points total) _____