

**DC FELLOWS PROGRAM**  
**MATH IMMERSION SUMMER COURSE**

DATA ANALYSIS AND STATISTICS  
JUNE 9, 2008

1. MULTIPLE CHOICE PROBLEMS

- (1) Compute the standard deviation of the following set of temperatures.

$\{37, 38, 35, 37, 38, 40, 36, 39\}$

- (a) 37.5
- (b) 1.5
- (c) 0.5
- (d) 2.5

- (2) Compute the median for the following data set:

$\{12, 19, 13, 16, 17, 14\}$

- (a) 14.5
- (b) 15.17
- (c) 15
- (d) 16

- (3) The number of pizza slices eaten per college student per year fits a normal distribution with a mean of 55 and a standard deviation of 15. The number of pizza slices eaten annually by the students in the top 2.5% of the distribution is greater than

- (a) 70
- (b) 85
- (c) 100
- (d) 110

- (4) Half of the students in a class scored 80% on an exam, and most of the rest scored 85%, except for one student who scored 10%. Which would be the best measure of the central tendency for the test scores?

- (a) mean
- (b) median
- (c) mode
- (d) both the median and the mode because they are equal.

- (5) Use the information in the relative frequency graph above to determine the average number of days it takes a sunflower seed to sprout.

- (a) 6
- (b) 6.5
- (c) 6.45
- (d) 6.4

- (6) The measures of hand spans of 9th-graders at Tyler High School are approximately normally distributed, with a mean of 7 inches and a standard deviation of 1 inch. Of the following groups of measurements of hand spans, which is expected to contain the largest number of 9th-graders?

- (a) Less than 6 inches
- (b) Greater than 7 inches
- (c) Between 6 and 8 inches
- (d) between 5 and 7 inches

Stem	Leaf							
9	1	3	4	5	7			
8	2	2	5	6	6	8	9	
7	0	2	4	5	8	8		
6	1	3	7	9				

- (7) The stem plot above shows the course grades that each of 22 students received in a history course. The course grade is represented by using the tens digit of each grade as a stem and the corresponding units digit as a leaf. For example, the stem 9 and the leaf 1 in the first row of the table represent a grade of 91. What was the median course grade of the 22 students?

- (a) 78
- (b) 80
- (c) 80.7
- (d) 82

## 2. STRUCTURED RESPONSE PROBLEMS

- (1) (Model) The table below shows, for eight employees of a certain company, the number of years of college education and the corresponding annual income.

Employee	Years of College	Annual Income (in thousands of dollars)
Al	1	20
Beth	2	30
Carlos	2.5	29
Denise	3	33
Eduardo	4	35
Felicia	6	57
Grace	6	58
Hugo	6.5	45

- (a) On an  $xy$ -grid, draw a scatterplot of the eight data points shown in the table. Graph “Years of college education” on the  $x$ -axis and “Annual Income” on the  $y$ -axis. Label each axis and show the units and scales used.
- (b) On the  $xy$ -grid drawn in part (a), sketch a line of best fit for the data shown in the table. Do not use your calculator for this part of the question. Explain how you chose your line.
- (c) Use a statistical function on your graphing calculator to find the equation of a line of best fit for the data shown in the table. Describe the input, the output, and the function(s) used.
- (d) Compare the line you sketched in part (b) with the line defined in part (c).
- (e) Using the line defined in part (c), find the annual income predicted for an employee who has 5 years of college education. Show your work. Using the line you sketched in part (b), find how many years of college education are predicted for an employee whose annual income is \$40,000. Indicate your answer on your graph.