

MA 202
Spring Semester 2004

WARNING: You must **SHOW ALL OF YOUR WORK**. You will receive NO CREDIT if you do not show your work.

DUE: THURSDAY, 19 FEBRUARY 2004

1. A Spanish 101 exam was given last Monday. The scores for Section 006 are given below.

23, 78, 90, 100, 56, 87,
67, 37, 100, 77, 83, 89,
92, 90, 45, 30, 2, 78,
87, 98, 67, 95, 94, 13,
21

- (a) Draw a line plot to represent these scores.
- (b) Draw a stem and leaf plot to represent these scores.
- (c) Draw a histogram to represent these scores. You should label the horizontal axis with 0–9, 10–19, 20–29, 30–39, 40–49, 50–59, 60–69, 70–79, 80–89, and 90–100.
- (d) What is the total area of all the columns in the histogram? How does this relate to your data?
- (e) Draw a line graph to represent these scores. You should label the horizontal axis with 0–9, 10–19, 20–29, 30–39, 40–49, 50–59, 60–69, 70–79, 80–89, and 90–100.
- (f) Use your histogram to find the total area under the line graph and above the horizontal axis. **HINT:** *You will probably need to draw a large histogram on a full sheet of paper and use a pair of scissors.*
- (g) Draw a bar graph to represent the grades on this exam. The grades are calculated as follows:

GRADE	SCORE
A	90-100
B	80-89
C	70-79
D	60-69
E	0-59

- (h) Draw a pie chart to represent the grades on this exam. Be sure to indicate the angles you used to construct the chart.
- (i) Calculate the mean score.

- (j) Calculate the median score.
 - (k) Find the mode.
 - (l) Find the upper quartile.
 - (m) Find the lower quartile.
 - (n) Find the Inner Quartile Range.
 - (o) Are there any outliers in this set of data? If so, what are the outliers?
 - (p) Construct a Box and Whisker Plot for these scores.
 - (q) Find the Standard Deviation for these scores.
 - (r) What percent of the scores are within one standard deviation of the mean?
 - (s) What percent of the scores are within two standard deviations of the mean?
 - (t) What percent of the scores are within three standard deviation of the mean?
 - (u) Draw a relative frequency histogram for this data. (That is to say, the vertical axis should denote the relative frequency of the scores, not the total number of students earning each score.) You should label the horizontal axis with 0–9, 10–19, 20–29, 30–39, 40–49, 50–59, 60–69, 70–79, 80–89, and 90–100.
 - (v) What is the the total area of the columns in the relative frequency histogram.
 - (w) Draw a frequency polygon.
 - (x) What is the area of the shape under the frequency polygon and above the horizontal axis?
2. When analyzing a set of data, what two characteristics should be measured.
 3. When would you need to take a random sample?
 4. What is the difference between a sample mean and a population mean? between a sample standard deviation and a population standard deviation?
 5. Can you think of a large set of data that does not have a normal distribution?
 6. **TRUE or FALSE:** Statistics are facts.
 7. Do number 15 on page 551.
 8. Do number 16 on pages 550–551.
 9. Do number 18 on page 551.
 10. Do number 14 on page 572.
 11. Do number 15 on page 572.
 12. Do number 16 on page 572.

13. Do number 17 on page 572.
14. Do number 18 on page 572.
15. Do number 22 on page 573.
16. Do number 2 on page 584.
17. Do number 6 on page 584.
18. Do number 8 on page 585.
19. Do number 12 on page 585.

REVIEW

20. Do number 9 on page 498 of your textbook.
21. (a) Write a function $A(r)$ for the area of a circle of radius r .
(b) Write a function $B(d)$ for the area of a circle of radius d .
(c) Find $A(2)$, $A(4)$, $A(3)$, $A(6)$, $A(.5)$, and $A(1)$. What do each of these values represent?
(d) How does the area of a circle change when we double its radius? Verify your answer using function notation. (*Hint*: If we double the radius r , then the new radius is expressed by _____ . Input the new radius into your area function A .)
(e) How does the area of a circle change when we double its diameter. Verify your answer using function notation.
(f) Which is the better deal: three ten inch pizzas for \$20 or one twenty inch pizza for \$20?
(g) Write a function $P(r)$ for the perimeter of a circle with radius r .
(h) How does the perimeter of a circle change when we double its radius? Verify your answer using function notation.
22. Prove that $2\sqrt{3} - 4$ is irrational. You may use the fact that $\sqrt{3}$ is irrational.
23. Jake can bake five dozen cookies in two hours. Joni can bake eight dozen cookies in two hours. If they work together, how long will it take them to bake twenty dozen cookies?