

EXAM 3
Math 105
April 21, 2003

Name _____

You must show all your work. Partial credit will be given.

1. Graph the nutritional information in the following table using a split bar graph. (8 pts)

Fast-Food Burgers: Nutritional Information		
	Calories	Calories From Fat
2-0z burger, plain	268	108
2 addl. oz of beef	154	90
1 slice cheese	105	81
3 slices bacon	109	81
1 tbsp. mayonnaise	100	99

2. The starting salaries (in thousands of dollars) of 20 graduates, chosen at random from the graduating class of an urban university, were determined and recorded in the table: (8 pts)

Starting Salaries				
34	29	27	39	41
28	32	37	35	36
23	31	33	34	29
27	30	31	31	25
27	35	29	30	32

Construct a frequency and relative frequency chart for this data (use an interval width of 4 starting at 22.5).

3. (a) Construct a histogram for the binomial distribution (6 pts)

$$P(x) = C_{3,x}(.5)^x(.5)^{3-x}.$$

- (b) What is the mean and the standard deviation of this binomial distribution? (4 pts)

4. Twenty persons were chosen at random from among the employees of a large corporation and their commute times (in hours) from home to work were determined and recorded in the table: (8 pts)

Commute Times				
0.5	0.9	0.2	0.4	0.7
1.2	1.1	0.7	0.6	0.4
0.4	0.8	1.1	0.9	0.3
0.4	1.0	0.9	1.3	0.4

Construct a histogram using a class interval width of 0.2 starting at 0.15.

5. Dr. Mad Scientist gave an exam in his calculus class. He had 20 students and they got the following test scores.

69, 73, 79, 87, 96, 99, 87, 79, 67, 66, 56, 72, 72, 66, 77, 98, 96, 79, 79, 73, 96, 70

- (a) Find the modal (mode) test score. (5 pts)
- (b) Find the median test score. (5 pts)
- (c) Find the mean test score. (5 pts)
- (d) Find the standard deviation of the test score. (5 pts)
6. Find the mean and the standard deviation for the set of grouped data: (8 pts)

Interval	Frequency
0.5-5.5	9
5.5-10.5	11
10.5-15.5	23
15.5-20.5	8

7. A fair die is rolled 23 times. What is the probability of obtaining exactly 5 twos? More than one two? (10 pts)
8. If the probability is .60 that a marriage will end in divorce within 20 years after its start, what is the average number of divorces (after 20 years) in a group of 33 couples? What is the standard deviation? (8 pts)
9. Given a normal distribution with a mean of 70 and a standard deviation of 8 find the probability that:
- (a) we are between 60 and 80? (5 pts)
- (b) we are at 88 or larger? (5 pts)

10. Honeynut Inc. sells roasted peanuts in 14 oz containers. The quality control department at Honeynut has determined that the actual content weight was normally distributed with a mean, μ , of 13.9 oz and a standard deviation, σ , of .2 oz. Based on this information what is the probability that a container of roasted peanuts:

(a) Will weigh between 13.8 and 14.2 oz.? (5 pts)

(b) Will weigh less than 13.6 oz.? (5 pts)

11. bonus: (5 pts)

In any family with two children the probability that both will be girls is .25. In a random sample of 1000 families, with two children, what is the approximate probability that more than 280 families will have two girls? (Use the normal approximation to the binomial distribution.)