

**Math 206 - Test 2**  
March 16, 2011

Name \_\_\_\_\_

Score \_\_\_\_\_

Show all work to receive full credit. Supply explanations where necessary.

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1. (4 points) A bucket contains 1 quarter, 2 dimes, 3 nickels, and 4 pennies. A coin is selected at random.

(a) What are the odds in favor of selecting a dime?

(b) What is the expected value of the game?

(c) If this game is to be fair, what should it cost to play? Explain.

2. (2 points) Describe a situation in which the most appropriate way to display data would be a bar graph.

3. Consider the following collection of test scores.

9, 72, 66, 83, 90, 78, 86, 85, 93, 78

- (a) (3 points) Find the median, the quartiles (Q1 and Q3), and the interquartile range.
  
- (b) (2 points) Compute the cutoff scores for outliers and identify all outliers.
  
- (c) (2 points) On the attached graph paper, construct the box plot using asterisks to denote outliers.
  
- (d) (1 point) Find the mode of the scores.
  
- (e) (1 point) Find the mean of the scores.
  
- (f) (1 point) Of the three measures of center computed above, which is least appropriate and why?
  
- (g) (1 point) What is the range?

(h) (1 point) Continuing with the same data set, use your calculator to compute the standard deviation.

(i) (1 point) Throw out the 9 and sketch the stem-and-leaf plot for the data.

(j) (1 point) Throw out the 9 and sketch the line plot for the data. (Do this on the attached graph paper.)

(k) (1 point) Explain why a line graph would not be appropriate to display the scores.

(l) (1 point) Using the mean and standard deviation you computed above, compute the  $z$ -score corresponding to a score of 82.

(m) (2 points) Five new scores with a mean of 86.4 were added to the collection of test scores. What is the mean of the entire collection of scores?

4. (3 points) The odds against the event  $A$  are 17 to 5. What are the odds in favor of  $A$ . What is the probability of  $A$ ?

5. (5 points) Design a simulation that could be used to estimate the solution of the following problem.

A person is selected at random and asked his/her birth month. On average how many people must be selected until you have encountered two people with the same birth month?

Perform several trials of your simulation and use your data to estimate the solution.

6. (3 points) When playing the Badgers, the Wombats always win. The following table shows the number of points that the Wombats may win by and their associated probabilities. How many points should the Wombats expect to win by?

Points	Probability
1	43%
2	16%
3	9%
4	23%
5	4%
6	5%

7. (3 points) Speaking of wombats, adult male wombats in Narawntapu National Park have a mean weight of 35.6 kg with a standard deviation of 2.8 kg. If the park is home to 254 adult male wombats, about how many weigh more than 36.5 kg?



9. (3 points) Stanley Smythe claims that his 40 ft by 60 ft house is often bombarded by falling meteors. (His neighbors and his insurance agent think he's crazy.)
- (a) What is the probability that a 6 ft by 6 ft sun window will be broken by a meteor destined to hit his roof?
  
  
  
  
  
  
  
  
  
  
  - (b) Stanley thinks he'll be safer if he installs four separate 3 ft by 3 ft sun windows. What do you think?
10. (3 points) Jason takes home \$4000 per month. His earnings are budgeted as follows: \$1000 mortgage, \$200 insurance, \$600 food, \$200 auto gas & maintenance, \$600 utilities, \$300 loan payment, \$450 savings, and the rest is reserved for miscellaneous expenses.
- (a) Explain why a circle graph is particularly appropriate for displaying this data.
  
  
  
  
  
  
  
  
  
  
  - (b) Recall that there are 360 degrees in a circle. Suppose you constructed the circle graph corresponding to the data above. What should be the degree measure of the angle in the portion associated with insurance?