

QUIZ 1 (CHAPTERS 1-4)

MATH 119 – FALL 2012 – KUNIYUKI
105 POINTS TOTAL, BUT 100 POINTS = 100%

**Show all work, simplify as appropriate, and use “good form and procedure” (as in class).
 Box in your final answers!**

No notes or books allowed. A scientific calculator is allowed.

Check one:

Can you easily print files from the class website?

Yes. I can print exam solutions and homework assignments.

No. Give me exam solutions and homework assignments in class.

- 1) (8 points). The Leeroy Jenkins Fan Club has 15 members. Do a stem-and-leaf plot (or stemplot) of their ages in years. Here are the ages:

45 64 32 25 38 36 51 38 61 62 22 40 57 26 43

- 2) (8 points total). A random sample of homeowners in a wealthy community is taken, and they are asked how many homes they own. All of the results are summarized in the frequency table below.

Number of homes	Frequency
1	39
2	52
3	41
More than 3	26

- a) Find the relative frequency of homeowners in the sample who own exactly two homes. Write your answer as a decimal rounded off to three decimal places.
- b) If we were to construct a pie chart, how large should the central angle be for the pie slice labeled “2 homes”? Give your answer to the nearest degree.

- 3) (33 points total). A statistics class has six students. Their scores on the final (in points) are listed below:

Bart	80
Lisa	98
Martin	100
Milhouse	80
Nelson	88
Ralph	70

- a) (4 points). Find the mean of these scores. Show work!
- b) (4 points). Find the median of these scores.
- c) (4 points). Find the mode of these scores.
- d) (4 points). Find the midrange of these scores.
- e) (4 points). Find the range of these scores.
- f) (13 points). Find the population standard deviation of these scores. Treat the data set as a population data set, not a sample data set. Round off your final answer to one decimal place. Show all work!

4) (2 points). Which of the following is more sensitive to outliers? Box in one.

The mean

The median

5) (5 points). Your grade in a class is based entirely on three midterms and a final exam. All of the exams are graded out of 100 points. You get midterm grades of 96, 82, and 67 points. You get 71 points on your final exam. Find your weighted class average if the midterms each count for 20% and the final counts for 40% of the overall grade. Do not round off; write your answer out to three significant digits. Show all work!

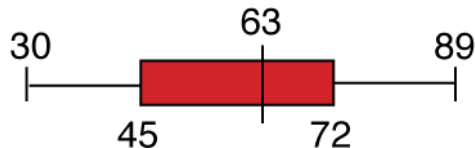
6) (4 points total; 2 points each). A large class takes a test.

a) According to Chebyshev's Theorem, **at least** what fraction (or percent) of the scores will lie within **two** standard deviations of the mean?

b) If we assume that the test scores have an approximately bell-shaped normal distribution, about what **percent** of the scores will lie within **two** standard deviations of the mean?

7) (4 points). Gremlins have a mean weight of 15 pounds, and the standard deviation of their weights is 3 pounds. Stripe, who is a Gremlin, weighs 23 pounds. Find the z score for Stripe's weight. Round off to two decimal places.

8) (4 points total; 2 points each). The scores on a test (in points) in a large class are summarized by the boxplot (also known as a "box-and-whisker" plot) below.



a) What score (in points) was the median score on the test?

b) What score (in points) was at the first quartile, Q_1 ?

FOR THE FOLLOWING PROBLEMS, IF YOUR FINAL ANSWER IS A PROBABILITY, YOU MUST WRITE IT AS EITHER:

- **AN EXACT FRACTION OF THE FORM $\frac{\text{INTEGER}}{\text{INTEGER}}$, OR**
- **AN EXACT DECIMAL OR AN EXACT PERCENT, OR**
- **A DECIMAL OR PERCENT ROUNDED OFF TO THREE SIGNIFICANT DIGITS. AVOID ROUNDING OFF INTERMEDIATE RESULTS.**

9) (4 points). All the voters in Shadyville vote for Mayor. Each voter has two choices: vote for Scum or vote for Slime. We find that 350 people voted, and 130 voted for Scum. What is the probability that a randomly selected voter in Shadyville voted for Slime?

10) (4 points total). Consider the following events:

Event A: Jack randomly picks a card and gets an Ace.

Event B: Jill flips a fair coin and gets “heads.”

Are the two events **mutually exclusive** (i.e., **disjoint**)? Box in one:

Yes

No

Are the two events **independent**? Box in one:

Yes

No

11) (3 points). A and B are events. Fill in the blank, based on a formula we have discussed in class:

$$P(A \text{ or } B) = P(A) + P(B) - \underline{\hspace{2cm}}$$

12) (5 points). The Smiths will have five children. What is the probability that all five will be of the same gender (all male or all female)? Assume that boys and girls are equally likely and that the births are independent with respect to gender.

13) (7 points). Fifteen men and ten women of equal ability run in a race. A gold medal is awarded for first place, a silver medal for second place, and a bronze medal for third place. What is the probability that a man wins the gold and women win the silver and the bronze? Assume that there are no ties.

14) (4 points total; 2 points each)

a) For any two possible events A and B , is it always true that

$P(B|A) = P(A|B)$? Box in one:

Yes

No

b) For any two **independent** possible events A and B , is it always true that

$P(B|A) = P(B)$? Box in one:

Yes

No

15) (10 points total). Each student at Adam Sandler University studies either Comedy or Drama, but not both. 327 of the female students study Comedy. 512 of the female students study Drama. 414 of the male students study Comedy. 298 of the male students study Drama. A student at the university is randomly selected. (A table will help!)

a) What is the probability that the student studies Comedy **or** is female?

b) Assume that we now know that the student is male. What is the conditional probability that the student studies Drama, given that he is male?