Math and Society - Math 111 **Midterm 1 Review**

The following problems are similar to ones you might see on the midterm exam.

1. An environmental group conducted a study to determine whether crows in a certain region were ingesting food containing unhealthy levels of lead. A biologist classified lead levels greater than 6.0 parts per million (ppm) as unhealthy. The lead levels of a random sample of 23 crows in the region were measured and recorded. The data are shown below.

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   2.8, 3.0, 3.5, 3.8, 3.8, 4.1, 4.1, 4.2, 4.6, 4.8, 4.8, 5.0,
   5.1, 5.2, 5.2, 5.3, 5.4, 5.9, 5.9, 6.3, 6.4, 6.6, 6.8
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   (a) What percent of crows in the sample had lead levels that are classified by the biologist as unhealthy?

   (b) Find the five number summary of the data, then draw a box and whisker plot.

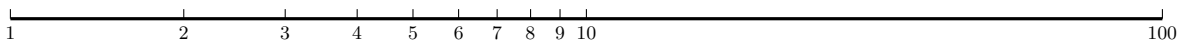
2. Suppose a swimming pool contains 10,000 cubic feet of water. A cubic foot of water is approximately 7.5 gallons, and a gallon weighs approximately 8.344 lbs. How much does the water in the pool weigh?

3. Use a strip of paper to help mark **exactly** where each of the following numbers belong on the logarithmic scale below.

   (a) 14

   (b) 70

   (c) 7/5



4. Suppose that I invest \$400 in the stock market. If my investments grow 50% the first year, then decline 30% the next, and then decline 20% in the third year, how much money will I have after three years?

5. Bob invests \$1,000 in a mutual fund that grows at 3% per year. Carol invests \$1,000 in a CD that grows 2% per year.

   (a) How much money do Bob and Carol have after 10 years?

   (b) Relative to Carol, how much more money does Bob have? Express your answer by completing the following sentence:

   Bob has _____% more money than Carol.

6. Which of the following best describes the chart below.

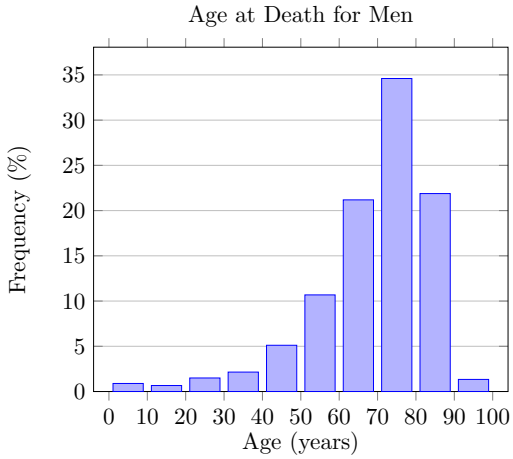
   A. It is skewed left and the mean is lower than the median.

   B. It is skewed right and the mean is lower than the median.

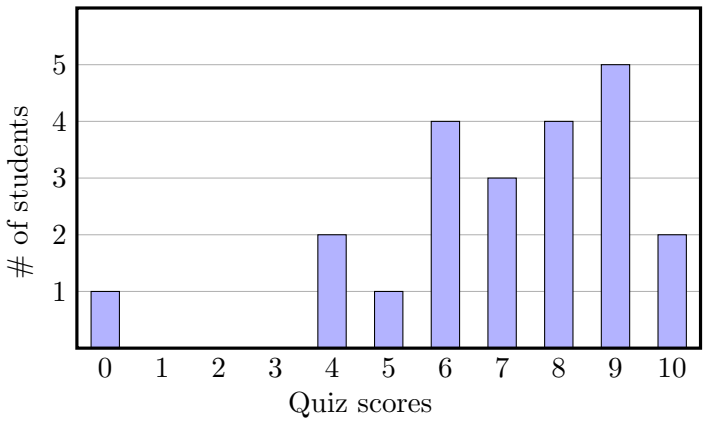
   C. It is skewed left and the mean is higher than the median.

   D. It is skewed right and the mean is higher than the median.

   E. The mean might be lower or higher than the median. You can't tell.



7. Consider the histogram below.



(a) How many students are there?

(b) What is the median?

(c) Write down a formula for the mean quiz score as a weighted average. Then find the mean.

8. The age of a tree is roughly proportional to the diameter of its trunk. Suppose that you know that one red maple tree has a trunk diameter of 10 inches and is 45 years old. A second red maple has a trunk diameter of 16 inches. Set up and solve a proportion equation to estimate how old that second tree is.

9. The Rule of 70 is a method for

A. finding the percentage growth.

B. finding the growth factor.

C. estimating the doubling time.

D. deciding if something is linear or exponential growth.

10. Suppose that a local reservoir has been losing water at a linear rate for since the beginning of the year. On the 10th day of the year, the reservoir had 200 million gallons and on day 20, the reservoir only had 150 million gallons.

    (a) Find the slope of the line that models the amount of water in the reservoir (y) as a function of the day (x).

    (b) What are the units of the slope?

    (c) Find the point slope formula for the line $y - y_0 = m(x - x_0)$.

    (d) At this rate, when will the reservoir be empty?

11. For each of the following patterns, determine whether it is growing exponentially or linearly.

    (a) 5, 25, 125, 625, ...

    (b) 160, 200, 240, 280, 320, ...

    (c) 1.05, 1.10, 1.15, 1.20, 1.25, ...