Math 13 - Homework 8

Name: _____ **Class Number:** _____

1) The proportion of observations from a Standard Normal distribution that takes values greater than 1.45 is about:

a. 0.9265
b. 0.0735
c. 0.0808

2) The proportion of observations from a Standard Normal distribution that takes values less than -1.25 is about:

a. 0.1151
b. 0.1056
c. 0.8849

3) The scores of adults on an IQ test are approximately Normal with mean 100 and standard deviation 15. Clara scores 132 on such a test. Her z-score is about:

a. 2.13
b. 2.80
c. 8.47

4) The scores of adults on an IQ test are approximately Normal with mean 100 and standard deviation 15. Clara scores 132 on such a test. She scores higher than what percent of all adults:

a. About 10%
b. About 90%
c. About 98%

5) Use the Normal Table to find the proportion of observations from a standard Normal distributino that falls in each of the following regions. In each case sketch a standard Normal curve and shade the area representing the region.

a. $z \leq -2.15$
b. $z \geq -2.15$
c. $z > 1.57$
d. $-2.15 < z < 1.57$

6) Find the number z such that the proportion of observations that are less than z in a Standard Normal distribution is 0.3

7) Find the number z such that 35% of all observations from a standard Normal distribution are greater than z

8) Emissions of sulfur dioxide by industry set off chemical changes in the atmosphere that result in "acid rain." The acidity of liquids is measured by pH on a scale of 0 to 14. Normal rain is somewhat acidic, so acid rain is sometimes defined as rainfall with a pH below 0.5. The pH of rain at one location varies among rainy days according the a Normal distribution with mean 5.43 and standard deviation 0.54. What proportion of rainy days have rainfall with pH below 5.0?

9) Suppose the heights of male graduate students are normally distributed with a mean of = 72 inches with standard deviation = 4 inches.

a. What is the probability that a male student will be over 75 inches tall?
b. What is the probability that a male student chosen at random is less than 69 inches but more than 67 inches tall?
c. Suppose that a dormitory order beds for these students. The beds should be of such a size that only one man in one hundred will be too tall for this bed. What should the length of the beds be?

10) The number of pages printed before replacing the cartridge in a laser printer is normally distributed with a mean of 11500 pages and a standard deviation of 800 pages. A new cartridge has just been installed.

a. What is the probability that the printer produces more than 12000 pages before this cartridge must be replaced?
b. What is the probability that the printer produces fewer than 10000?

11) Refer to the previous question. The manufacturer wants to provide guidelines for potential customers advising them of the minimum number of pages they can expect from each cartridge. How many pages should it advertise if the company wants to be correct 99% of the time?

12) A manufacturer of alkaline batteries has observed that its batteries last for an average of 26 hours when used in a toy racing car. The amount of time is normally distributed with a standard deviation of 2.5 hours.

a. What is the probability that the battery lasts between 24 and 28 hours?
b. What is the probability that the battery lasts longer than 28 hours?
c. What is the probability that the battery lasts less than 24 hours?

13) The amount of money spent weekly on cleaning, maintenance, and repairs at a large restaurant was observed over a long period of time to be approximately normally distributed, with mean \$615 and standard deviation \$42.

a. If \$646 is budgeted for next week, what is the probability that the actual costs will exceed the budgeted amount?
b. How much should be budgeted for weekly repairs, cleaning, and maintenance so that the probability that the budgeted amount will be exceeded in a given week is only 0.10?