

**Problems: THE CENTRAL LIMIT THEOREM**

1. Assume that  $X \sim N(-8, 7)$ .

- a. What value of  $X$  would be greater than the values of six out of one hundred random variables from this distribution?
- b. What is the probability that a random variable from this distribution might take a value larger than zero?

2. If  $X \sim N(9, 4)$ , what are the distributions of

a.  $U = X - 9$

b.  $V = X/2$

c.  $W = 20 * \left( \frac{16X - 2}{7} \right)$

3. State the central limit theorem and explain what the theorem tells you about the distribution sampled, the distribution of the sample, and the sampling distribution.

4. A random sample of 20 Iowans were asked a number of questions about their attitudes toward foreigners. You combine responses on these items into a "prejudice" measure. Values on your prejudice measure range from 0 = no prejudice to 25 = extreme prejudice. Your twenty data points are:

1, 3, 19, 8, 0, 7, 20, 8, 3, 4, 5, 8, 9, 14, 6, 3, 10, 2, 15, 9.

Estimate the variance in Iowans' prejudice scores for the distribution sampled, for the distribution of the sample, and for the sampling distribution. State in words what each of these three statistics means.