Mrs. Daniel- AP Stats
Normal Distributions Practice WS # 2

Directions: Draw a normal curve – label mean and 3 sets of standard deviations. Then, answer each question – you must show how you obtained the answer!

1. The vending machine in the ATM cafeteria usually dispenses about 6 ounces of soft drink. Lately, it is not working properly, and the variability of how much of the soft drink it dispenses has been getting greater. The amounts are normally distributed with a standard deviation of 0.2 ounces.

   a. What percent of the time will you get more than 6 ounces of soft drink?
      \[ \text{normal cdf} (6, \infty, 6, 0.2) = 50\% \]

   b. What percent of the time will you get less than 6.2 ounces of soft drink?
      \[ \text{normal cdf} (0, 6.2, 6, 0.2) = 84.13\% \]

   c. What percent of the time will you get between 5.8 ounces and 6.4 ounces of soft drink?
      \[ \text{normal cdf} (5.8, 6.4, 6, 0.2) = 81.86\% \]

2. A company manufactures 1000 compact discs per hour that are supposed to be 120 millimeters in diameter. These CDs are made for drives 122 millimeters wide. The sizes of CDs made by this company are normally distributed with a standard deviation of 1 millimeter.

   a. In one hour, how many CDs would you expect to be between 119 and 122 millimeters?
      \[ \text{normal cdf} (119, 122, 120, 1) = 0.81859 \times 1000 \Rightarrow 818.5 \text{ CDs} \]

   b. About how many CDs per hour will be too large to fit in the drives?
      \[ \text{normal cdf} (122, \infty, 120, 1) = 0.0022 \times 1000 \Rightarrow 22 \text{ CDs} \]
3. A recent study showed that the systolic blood pressure of high school students ages 14 - 17 is normally distributed with a mean of 120 and a standard deviation of 12. Suppose a high school has 800 students.

a. About what percent of the students have blood pressure below 108?

\[ \text{normalcdf}(-\infty, 108, 120, 12) = 0.8787 \% \]

b. About how many students have blood pressure between 108 and 144?

\[ \text{normalcdf}(108, 144, 120, 12) = 0.818395 \quad \text{multiply by 800} \]

\[ 655 \]

c. About what percent of the students have blood pressure between 96 and 156?

\[ \text{normalcdf}(96, 156, 120, 12) = 0.9759 \% \]

d. About how many students have blood pressure above 144?

\[ \text{normalcdf}(144, \infty, 120, 12) = 0.024075 \quad \text{multiply by 800} \]

\[ 18 \]

4. Mrs. Berkson gave a test in her Pre-Calc class that has 32 students. The scores were normally distributed with a mean of 85 and a standard deviation of 3.

a. How many students scored at least a 79?

\[ \text{normalcdf}(79, 100, 85, 3) = 0.97725 \times 32 = 31 \]

b. How many students scored between 82 and 91?

\[ \text{normalcdf}(82, 91, 85, 3) = 0.818595 \times 32 = 26 \]

c. How many students scored below an 88?

\[ \text{normalcdf}(0, 88, 85, 3) = 0.841345 \times 32 = 26.9 \approx 27 \]