STAT 201 - Week-In-Review 8

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Problem Statements

1. Consider a non-negative continuous random variable X with $\mathrm{P}(\mathrm{X} > 6.45) = 0.17$.

   (a) Find $\mathrm{P}(\mathrm{X} \geq 6.45)$.

   (b) Find $\mathrm{P}(\mathrm{X} \leq 6.45)$.

   (c) Find $\mathrm{P}(\mathrm{X} < 6.45)$.

   (d) Find $\mathrm{P}(\mathrm{X} = 6.45)$.

2. Suppose a STAT 201 student just found out that she scored 75 on Midterm 1, with a z-score of -0.5. Her friend, who is in a different section with the same professor, also scored 75 but had a z-score of 0.5. What can you conclude about the average Midterm 1 scores in the classes?

   (a) The Midterm 1 class averages must both be equal to 75.
   (b) The student's class had a lower Midterm 1 average than her friend's class average.
   (c) The student's class had a higher Midterm 1 average than her friend's class average.
   (d) The Midterm 1 scores for the two classes must have the same standard deviations.
   (e) The class averages cannot be compared unless we know the corresponding standard deviations.

3. It is known that when a specific type of radish is grown in a certain manner without fertilizer the weights (X) of the radishes produced are normally distributed with a mean of 40 gram and a standard deviation of 10 gram.

   (A) Use the empirical rule to determine the percentage of radishes grown without fertilizer with weights less than 50 grams.

   (B) Use the empirical rule to determine the percentage of radishes grown without fertilizer with weights between 20 grams and 60 grams.

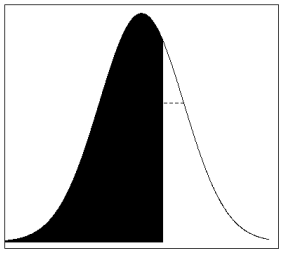
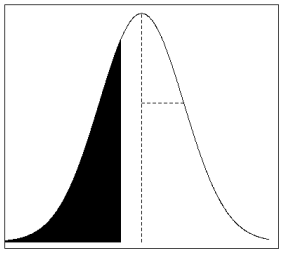
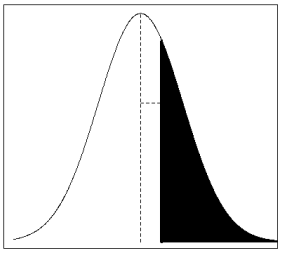
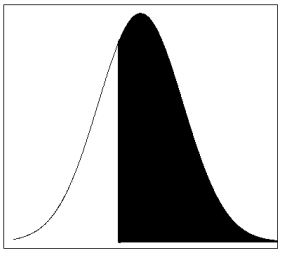
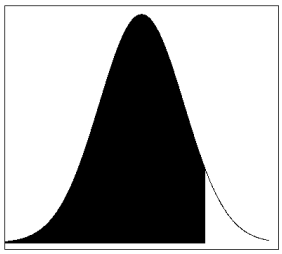
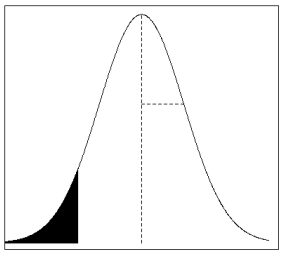
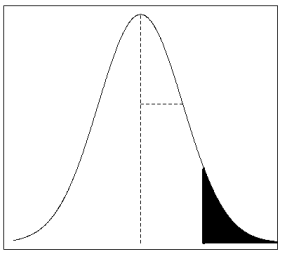
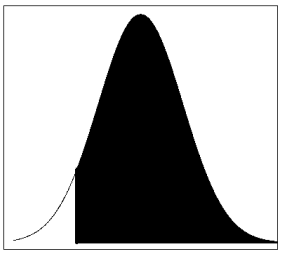
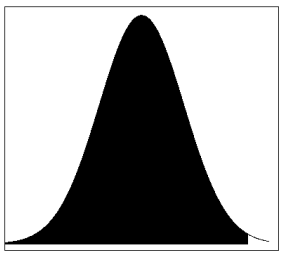
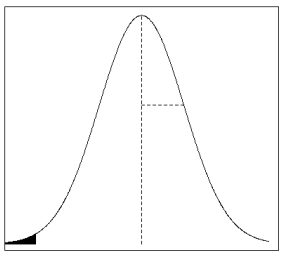
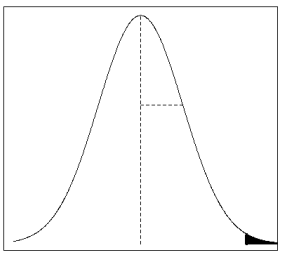
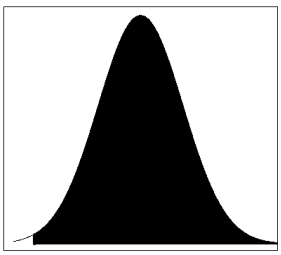
   (C) Use the empirical rule to determine the percentage of radishes grown without fertilizer with weights more than 60 grams.

4. The impurity level in a batch of chemicals is approximately normally distributed with a population mean of $\mu = 4\%$ and a population standard deviation of $\sigma = 1.5\%$.

   For a randomly selected batch of chemicals, find the approximate probability that the impurity level is between 3.4% and 4.3%.

5. The distribution of salt per cubic meter of seawater is N($\mu = 9.29, \sigma = 2.2$) grams. We want to know the probability that a random meter of seawater would have more than 12.59 grams of salt per cubic meter.

   Which picture below shows that probability?

6. The mean June midday temperature in Desertville is 36°C and the standard deviation is 3°C. Assuming this data to be normally distributed, how many days in June would you expect the midday temperature to be between 39°C and 42°C? Round up your answer to the next positive integer.

7. When it rains in College Station the average amount of rain is N($\mu = 7.92, \sigma = 2.2$) cm. If it rains too much the City Council worries about flooding. Fortunately, it only happens 3.92% of the time. How much rain is enough to worry the City Council?

8. Which of the following QQ-plots should correspond to a sample of size n = 500 drawn from a normal distribution?