# Unit 6 – Data Analysis and Probability
## Assessment

1. In a normal distribution curve, what % of the total is within one standard deviation of the mean?

   A. 95% B. 68% C. 34% D. 99.7%

2. A surprise quiz contains three multiple choice questions; question 1 has 3 suggested answers, question 2 has four, and question 3 has two. A completely unprepared student decides to choose the answers at random. If X is the number of questions the student answers correctly, find the probability distribution of X.

3. This probability histogram shows the distribution for a random variable X.   What is the probability that X is at most 3?
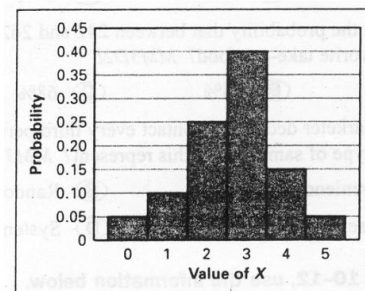
   A.   0.05
   B.   0.15
   C.   0.80
   D.   0.95

4. What is the percent of the area under a normal curve that is represented by the shaded region?
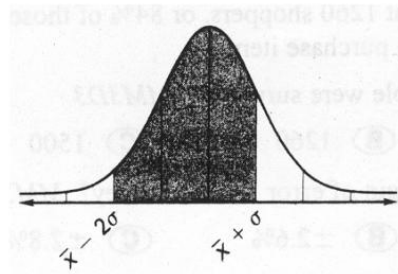
   A.   18.5%
   B.   47.5%
   C.   95%
   D.   81.5%

5. The probability that a voter will believe a rumor about a politician is 0.2. If 20 voters are told individually, determine the mean and standard deviation of the number who believe the rumor.

6. What is the mean and standard deviation of a normal distribution that approximates the binomial distribution with 50 trials and a probability of success on each trial of 0.25?

   A. mean = 12.5; σ = 3.1   B. mean = 12.5; σ = 3.5
   C. mean = 37.5; σ = 3.1   D. mean = 37.5; σ = 6.1

7. Sarah receives a grade of 70 out of 100 on her English Literature exam. If the mean of the class grades is 60 with a standard deviation of 15, what is the z-score of Sarah's grade?

    A. 0.3333   B. 0.50   C. 0.6667   D. 0.9463

8. As in the previous question, suppose that you are in an English Literature class. The top 10% of the class will be eligible for an advanced English Literature class.
    If the mean of the class's final grades is 60 with a standard deviation of 15 and the z-score of the 90th percentile is 1.282, what score would you need to receive in order to be eligible for the advanced class?

    A. 79.23   B. 83.27   C. 89.52   D. 75.36

9. In a study of cell phone use and the risk of brain cancer, the researchers matched each patient of 469 people who have brain cancer with a person of the same sex, age and race (everything else the same) who did not have brain cancer, then asked about their use of cell phones. Is this an observational or experimental study?

    A. Experimental   B. Observational

10. A researcher is conducting a study to determine the effect that the flu vaccine has on preventing the flu. The participants in the study are a group of people who received the flu vaccine and a group of people who did not receive the flu vaccine. Is this an observational or experimental study?

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Assessment Key

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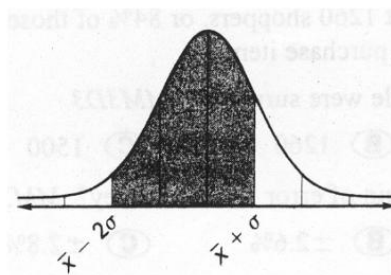 | X | 0 | 1 | 2 | 3 |
   |------|------|-------|------|------|
   | P(X) | 6/24 | 11/24 | 6/24 | 1/24 |

3. This probability histogram shows the distribution for a random variable X.   What is the probability that X is at most 3?

   E.   0.05
   F.   0.15
   G.   0.80
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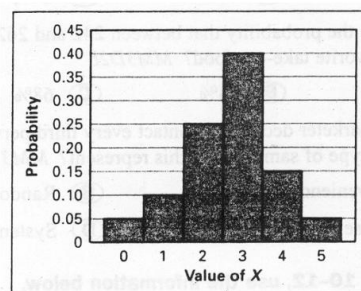
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   $\mu = 4$, $\sigma = 1.7885$

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