

CHAPTER 6: THE NORMAL DISTRIBUTION

1. In its standardized form, the normal distribution
 - a) has a mean of 0 and a standard deviation of 1.
 - b) has a mean of 1 and a variance of 0.
 - c) has an area equal to 0.5.
 - d) cannot be used to approximate discrete probability distributions.

2. Which of the following about the normal distribution is **not** true?
 - a) Theoretically, the mean, median, and mode are the same.
 - b) About 2/3 of the observations fall within 1 standard deviation from the mean. \pm
 - c) It is a discrete probability distribution.
 - d) Its parameters are the mean, μ , and standard deviation, σ

3. Given that X is a normally distributed variable with a mean of 50 and a standard deviation of 2, find the probability that X is between 47 and 54.

4. A company that sells annuities must base the annual payout on the probability distribution of the length of life of the participants in the plan. Suppose the probability distribution of the lifetimes of the participants is approximately a normal distribution with a mean of 68 years and a standard deviation of 3.5 years.
 - a) What proportion of the plan recipients would receive payments beyond age 75?
 - b) What proportion of the plan recipients die before they reach the standard retirement age of 65?
 - c) Find the age at which payments have ceased for approximately 86% of the plan participants.

5. If we know that the length of time it takes a college student to find a parking spot in the library parking lot follows a normal distribution with a mean of 3.5 minutes and a standard deviation of 1 minute,
 - A) Find the probability that a randomly selected college student will find a parking spot in the library parking lot in less than 3 minutes.
 - a) 0.3551
 - b) 0.3085
 - c) 0.2674
 - d) 0.1915
 - B) Find the probability that a randomly selected college student will take between 2 and 4.5 minutes to find a parking spot in the library parking lot.
 - a) 0.0919
 - b) 0.2255
 - c) 0.4938
 - d) 0.7745
 - C) 75.8% of the college students will take more than how many minutes when trying to find a parking spot in the library parking lot?
 - a) 2.8 minutes
 - b) 3.2 minutes
 - c) 3.4 minutes
 - d) 4.2 minutes

6. The owner of a fish market determined that the mean weight for a catfish is 3.2 pounds with a standard deviation of 0.8 pound.

A) Assuming the weights of catfish are normally distributed, the probability that a randomly selected catfish will weigh more than 4.4 pounds is _____?

B) Assuming the weights of catfish are normally distributed, the probability that a randomly selected catfish will weigh between 3 and 5 pounds is _____?

C) A citation catfish should be one of the top 2% in weight. Assuming the weights of catfish are normally distributed, at what weight (in pounds) should the citation designation be established?

a) 1.56 pounds

b) 4.84 pounds

c) 5.20 pounds

d) 7.36 pounds

D) Assuming the weights of catfish are normally distributed, above what weight (in pounds) do 89.80% of the weights occur?

E) Assuming the weights of catfish are normally distributed, the probability that a randomly selected catfish will weigh less than 2.2 pounds is _____?

7) The number of column inches of classified advertisements appearing on Mondays in a certain daily newspaper is normally distributed with population mean of 320 and population standard deviation of 20 inches.

A) for a randomly chosen Monday, what is the probability there will be less than 340 column inches of classified advertisement?

B) for a randomly chosen Monday, what is the probability there will be between 280 and 360 column inches of classified advertisement?

C) for a randomly chosen Monday the probability is 0.1 that there will be less than how many column inches of classified advertisements?

D) a single Monday is chosen at random. State in which of the following ranges the number of column inches of classified advertisement is most likely to be: a) 300 --320

b) 310 --330

c) 320 -- 340

d) 330 -- 350

8) John works at a jewelry store he is paid \$15,000 per month, plus a commission. His monthly commission is normally distributed with mean \$10,000 and standard deviation \$2000.

A) for a given month, what is the probability that John's commission from the jewelry store is less than \$13,000?

B) for a given month, what is the probability that John's commission from the jewelry store is no more than \$8,000?

- C) Referring to Scenario 6-2, for a given month, what is the probability that John's commission from the jewelry store is at least than \$12,000?
- D) for a given month, what is the probability that John's commission from the jewelry store is more than \$9,500?
- E) for a given month, what is the probability that John's commission from the jewelry store is between \$11,000 and \$12,000?
- F) for a given month, what is the probability that John's commission from the jewelry store is between \$5,000 and \$7,000?