

Week-In-Review #10 (8.5, 8.6, 5.1)

1. Let Z be the standard normal random variable. Calculate the following probabilities:

(a) $P(-2 \leq Z < 0.22)$

(b) $P(Z \leq 1.75)$

(c) $P(Z > -0.35)$

2. Let Z be the standard normal random variable. Find a such that

(a) $P(Z < a) = 0.8158$

(b) $P(Z > a) = 0.3257$

(c) $P(-a < Z < a) = 0.6102$

3. Let X be a normal random variable with $\mu = 260$ and $\sigma = 35$. Find each of the following.

(a) $P(X < 200)$

(b) $P(X \geq 180)$

(c) The value of a such that $P(260 < X < a) = 0.22$

(d) The values of a and b such that $P(a < X < b) = 0.4198$ if a and b are symmetric about the mean.

4. Suppose weights of bags of snack mix are normally distributed with a mean of 10 ounces and a standard deviation of 0.6 ounces. What is the probability that a bag selected at random weighs

(a) Between 9.5 and 11 ounces?

(b) At least 9 ounces?

(c) Less than 8.5 ounces?

5. A study finds that the lifespan of phone batteries are normally distributed with a mean of 2 years and a standard deviation of 1.5 months.

(a) What is the probability that a phone battery will have a lifespan between 22 and 26 months?

(b) What battery lifespan corresponds to the 95th percentile?

- Find the amount of money at the end of 5 years on a \$200 deposit in an account paying simple interest at a rate of 4.75% per year. How much interest is earned?
- A bank deposit paying simple interest grew from an initial sum of \$2000 to a sum of \$2150 in 7 months. Find the interest rate.
- How much money will be in an account after 2 years on a \$500 deposit that earns interest at a rate of 5% per year compounded continuously?
- If Mark invests \$5000 into an account paying interest at a rate of 8% per year compounded monthly, how much money will he have at the end of 5 years (assuming no additional deposits or withdrawals)?

14. Which account would be a better account for an investment? For a credit card?

OPTION A: 9% per year, compounded monthly

OPTION B: 8.8% per year, compounded daily

OPTION C: 8.9% per year, compounded continuously

15. Determine whether the following statements are True or False.

(a) A normal curve with a higher variance is taller than one with a lower variance.

(b) In a normal distribution, approximately 99.73% of the data lies further than 3 standard deviations from the mean.

(c) A normal random variable with a mean of zero is the standard normal curve.

(d) The more times a year an account is compounded, the more interest that is earned.