Assignment

Write

Explain how percents of data from normal distributions can be used to determine probabilities.

Remember

You can use the probabilities interpreted from a normal distribution to compare data sets and make decisions based on the comparisons.

Practice

1. Marine biologists in Florida are studying the tiger shark to determine the factors that are contributing to their diminishing population. Adult tiger sharks along the Atlantic Coast of Florida have a mean length of 11.5 feet with a standard deviation of 0.9 foot. Adult tiger sharks along the Gulf Coast of Florida have a mean length of 11.9 feet with a standard deviation of 0.6 foot. Tiger shark lengths are normally distributed.

   a. The biologists need to capture 1 more adult tiger shark at least 13 feet in length for their study. Along which coast will the researchers have a higher probability of capturing the shark they need? Explain your reasoning.

   b. The biologists need to capture 1 more adult tiger shark less than 10.5 feet in length in order to complete their study. Along which coast will the researchers have a higher probability of capturing the shark they need? Explain your reasoning.

2. Chicken eggs are sold according to their size. The chart shows how eggs are classified by their size.

Egg Size	Weight (ounces)
Extra-Large	$2.25 < m \le 2.5$
Large	$2.0 < m \le 2.25$
Medium	$1.75 < m \le 2.0$

The eggs produced at Jen's Hen Farm and Rick's Chick Farm are normally distributed. The eggs produced at Jen's Hen Farm have a mean weight of 2.11 ounces and a standard deviation of 0.08 ounce. The eggs produced at Rick's Chick Farm have a mean weight of 2.15 ounces and a standard deviation of 0.07 ounce. Each farm produces a total of 100,000 eggs per month.

   a. If Jen and Rick each randomly select an egg from their farm, who is more likely to select an egg classified as large?

   b. If Jen and Rick each randomly select an egg from their farm, who is more likely to select an egg classified as medium?

   c. Jen and Rick sell their extra-large eggs for 90 cents per dozen. Estimate the amount of money they each make per month from the sale of extra-large eggs.

Stretch

1. Consider the shark problem from the Practice section.
   a. What is the probability that a biologist catches an adult tiger shark along the Atlantic Coast of Florida that has a mean length of exactly 11.6 feet? Explain your reasoning.
   b. A fisherman claims he caught an Adult tiger shark along the Gulf Coast of Florida that was more than 25 feet long. Andre claims it is impossible because the calculator displays the probability as 0. Is Andre correct? Explain your reasoning.

Review

1. Women's heights are normally distributed. The average height of a woman is 65 inches with a standard deviation of 2.5 inch.
   a. What percent of women are taller than 66 inches?
   b. What percent of women are between 63 and 66.5 inches tall?
   c. Determine the height of a woman in the 90th percentile.
2. The outside temperature over a day can be modeled by the equation $T(t) = 16 \cos\left(\frac{\pi}{12}t\right) + 80$, where t represents the number of hours past midnight, and $T(t)$ represents the temperature in degrees Fahrenheit. Determine each characteristic and describe what it means in terms of this problem situation.
   a. Amplitude
   b. Period
   c. Vertical shift
3. Solve the equation $-4 + 6 \cos x = -7$ for $0 \leq x \leq 2\pi$.