

Assignment

Write

Write the term that best completes each statement.

1. A normal curve models a theoretical data set that is said to have a _____.
2. _____ are data which can take any numeric value within a range.
3. A bell shaped curve that is symmetric about the mean of a data set is a _____.
4. Data whose possible values are countable and often finite are _____.
5. The _____ of a population is often represented with the symbol μ .
6. The _____ of data is a measure of how spread out the data are and its often used symbol is σ .

Remember

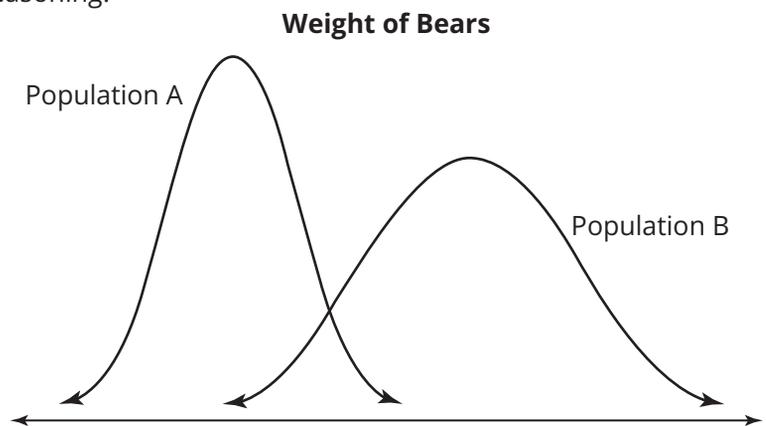
The shape of a distribution can change as the number of data points increase and the size of the intervals decrease. A relative frequency histogram will likely start to resemble a normal curve. The smaller the standard deviation, the closer most of the data lie to the mean.

Practice

1. Two hundred runners completed the annual Burgoo Festival 5K race.
 - a. The table displays the race times for the 200 runners. Complete the table to determine the relative frequency for each interval of race times.
 - b. Create a relative frequency histogram to represent the race times of the 200 runners.
 - c. Does the distribution of the race time data appear to be a normal distribution? Explain your reasoning.

Race Time (minutes)	Number of Runners	Relative Frequency
14 – 18	7	
18 – 22	28	
22 – 26	65	
26 – 30	71	
30 – 34	24	
34 – 38	5	

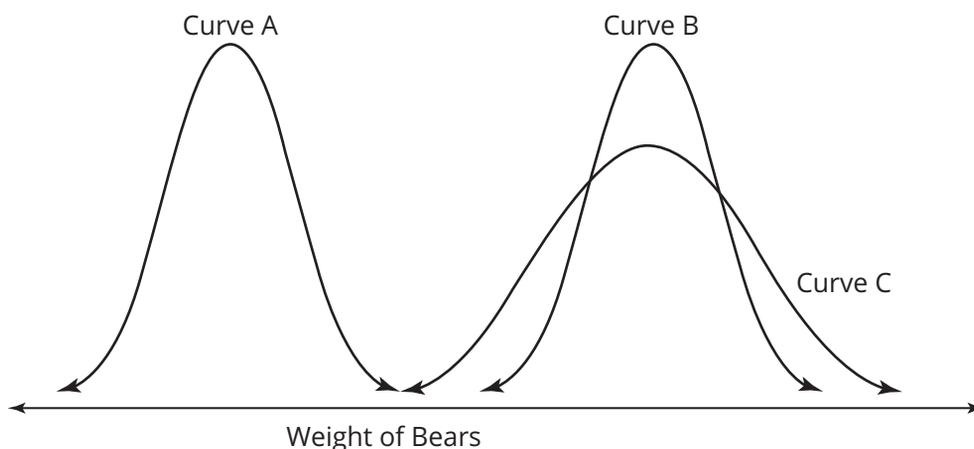
2. Wildlife biologists recorded the weights of grizzly bears in two different populations. The normal curves represent the weights of the bears in Population A and the weights of bears in Population B.
 - a. Which population has the greater mean weight? Explain your reasoning.
 - b. Which population has the greater standard deviation? Explain your reasoning.
 - c. Explain what the difference in the standard deviations means in terms of this problem situation.



- d. Two years after the original data was recorded, the biologists recorded the weights of the bears in Population A again. The mean weight had increased by 5 pounds, but the standard deviation remained the same. Explain what the difference in the new data and the original data means in terms of this problem situation.
- e. Two years after the original data was recorded, the biologists recorded the weights of the bears in Population B again. The mean weight was the same, but the standard deviation had decreased. Explain what the difference in the new data and the original data means in terms of this problem situation.

Stretch

1. Consider the three normal curves shown. Determine a plausible data set for each curve. Explain your reasoning.



Review

- The equation $d(t) = 9 \cos\left(\frac{\pi}{4}t\right)$ can be used to model the distance the pendulum of a clock is in inches from its center position as a function of time. The pendulum is released from its rightmost position. Assume that the right of center is a positive distance and the left of center is a negative distance.
 - Determine the pendulum's distance from the center at 11 seconds.
 - Determine when the pendulum is 4 inches to the left of center.
- Use a periodicity identity to list 3 solutions for the equation $\tan x = -\sqrt{3}$.
- Solve the equation $3 - 2 \tan \theta = -2$ over the domain of all real numbers.
- Write an equation of a sine curve with amplitude 4, period 3, and phase shift 2.
- Write an equation of a cosine curve with amplitude $\frac{1}{2}$, period $\frac{\pi}{3}$, and phase shift $-\frac{3}{2}$.