Suppose that out of 1200 cars parked at the beach, 450 of them are compact cars, 200 are convertibles. 150 are both compact and convertible. What is the probability that a car selected at random would be compact or a convertible?

$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$

$450 + 200 - 150 = 500$

$\frac{500}{1200} = \frac{5}{12}$

A standard deck of cards has 52 cards of 4 different suits (13 hearts, 13 spades, 13 diamonds, and 13 clubs). A standard number cube has six sides, numbered 1 – 6. A card is drawn and the number cube is rolled.

Find P(drawing a heart and rolling a 5).

$\frac{13}{52} = \frac{1}{4}$ $\frac{1}{4} + \frac{1}{6}$

$\frac{3}{12} + \frac{2}{12} = \frac{5}{12}$

Part A

The histograms show the distribution of heart rates of randomly selected adult males between the ages of 40 and 45 after 20 minutes of continuous exercise. The adult males were randomly assigned to use either a new elliptical machine (Experimental Group) or a traditional treadmill machine (Control Group).

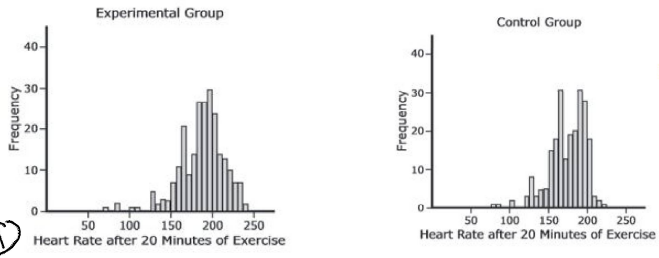
Zoe

What conclusion about the difference between the distributions of the hear rates for the two groups can be drawn? Justify your answer.

There is significant differences between the differences of the heart rates for the two groups. The distributions are nearly identical.

Part B

After the participants worked out three times per week for four weeks solely on their assigned machines, participants' heart rates were collected again after 20 minutes of continuous exercise. The data are shown in the histograms.



(A) What conclusion about the difference between the distributions of the hear rates for the two groups can be drawn? Justify your answer.

(A) There appears to be significant differences between the two groups. The mean looks to be lower for the control group.

(B) If the target heart rate range for adult males aged between 40 and 45 after 20 minutes of exercise is around 175 beats per minute, what recommendation would you make in terms of which machine to use? Justify your answer

(B) I would recommend using the traditional. The mean appears to be closer to 175 beats per minute.

(C) Based upon these data, what conclusion about exercise machines in general can be made?

(C) Results cannot be generalized as the data was only collected at this one gym.

For a statistics project, a group of students decide to collect data in order to approximate the percent of people in the town who are left-handed. They ask every third student entering the school cafeteria whether he or she is left-handed or right-handed. What type of method did this group use? Explain which population the group can draw a conclusion about based on their method. Suggest a better method that would allow the students to draw a conclusion about all the residents in their town.

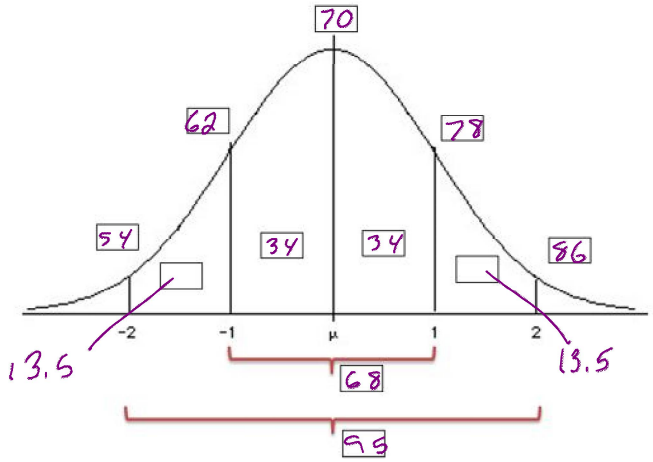
The students used a random sample survey method. the students can draw a valid conclusion about the students eating in the school cafeteria. They can use a random sample survey throughout the town.

The heights of the male students at a college are approximately normally distributed. Within this curve, 95% of the heights, centered about the mean, are between 62 inches and 78 inches. The standard deviation is 4 inches. Use this information to estimate the mean height of the males. Approximate the probability that a male student is taller than 74 inches. Explain how you determined your answers.

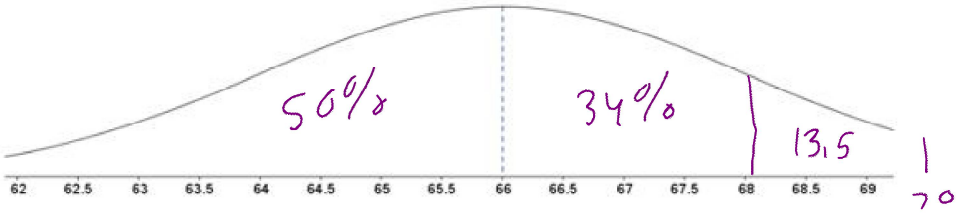
I used the 62 and 78 to find the mean of 70. Since 68% of the data is between 66 and 74, 34% is between 70 and 74, and 50% is between 0 and 70. 50+34=84, and 100-84=16, so 16% of the males are taller than 74 inches. The probability is 0.16.

Drag and drop the correct numbers to build a normal distribution graph based on a mean of 70 and a standard deviation of 8. (All numbers will not be used.)

2.35%	2.35%	13.5%	13.5%
34%	46	54	62
34%	78	68%	94
70	86	95%	99.7%



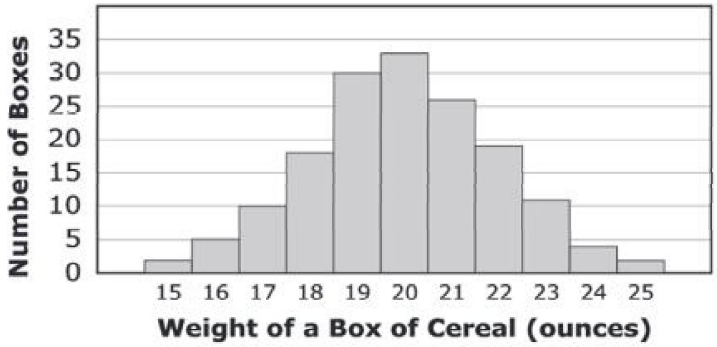
In a group of 400 high school males how many males would you expect to be 5'10" or taller if the standard deviation for the set of data is 2 inches? A partial graph of this normal distribution is shown below.



The mean height is 66 in (5'6"). 97.5% of all heights are below 70 in (5'10"). So 2.5% will be above 5'10".
400(.025) = 10 students

The distribution of weights (rounded to the nearest whole number) of all boxes of a certain cereal is approximately normal with mean 20 ounces and standard deviation 2 ounces.

A sample of the cereal boxes was selected, and the weights of the selected boxes are summarized in the histogram shown.



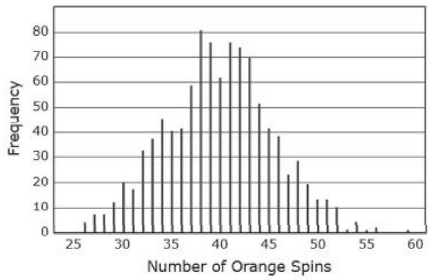
If w is the weight of a box of cereal, which range of weights includes all of the weights of cereal boxes that are within 1.5 standard deviations of the mean?

Answer is (A)

(A) $17 \leq w \leq 23$ (B) $18.5 \leq w \leq 21.5$ (C) $19 \leq w \leq 21$ (D) $20 \leq w \leq 23$

A circular spinner is divided into five sectors of different colors. A student spun the arrow on the spinner 200 times and recorded that the arrow stopped on the orange sector 38 times out of the 200 spins. To test whether the spinner was fair, the student used a computer to simulate the number of times the arrow stops on orange in 200 spins of a fair spinner equally divided into five sectors of different colors. The results of 1,000 trials of the simulation are shown.

Simulation Results



Based on the results of the simulation, is there statistical evidence that the spinner is not fair?

Ⓐ Yes, because 38 was the most frequent outcome.

Ⓑ Yes, because about 8% of the outcomes were 38.

Ⓒ No, because the distribution is approximately normal.

Ⓓ No, because an outcome of 38 or less is not unusual.