

1. The average height of an Indian woman is 152.6 centimetres. Can you determine the median height of Indian women based on this information?

Option A - Cannot be determined

Option B - 152.6

Option A feedback - Assume that the data of Indian women's heights is normally distributed and uses the property of normal distribution.

Option B feedback - Assume that the data comprising Indian women's heights is normally distributed. The mean, median, and mode are the same for a normally distributed dataset.

So, the median height of Indian women should be 152.6 centimetres.

2.

The dataset of employees' salaries after tax deduction in a company of 500 employees is stored here:

https://docs.google.com/spreadsheets/d/1MwM1jtLbOe1QE83erqrH3ALXx9zkwZ1R-_ZINne0pV0/edit#gid=0

This data is normally distributed (you can verify this by constructing a histogram).

Answer the following questions:

1. What is the value that represents the mean, median, and mode of the data?
(1 attempt)

Option A - ₹21348.51

Option B - ₹19983.05

Option A feedback - Use the formula '=average()' and select the entire data in the Excel sheet.

Option B feedback - Use the formula '=average()' and select the entire data in the Excel sheet, and you will obtain ₹19983.05.

2. What is the standard deviation of the data?
(1 attempt)

Option A - ₹1006.908

Option B - ₹500

Option A feedback - Use the formula '=STDEV()' and select the entire data, and you will get ₹1006.908.

Option B feedback - Use the formula '=STDEV()' and select the entire data.

3. What is the probability that the salary of a randomly selected employee is in the range of ₹18,976 to ₹20,989?
(1 attempt)

Option A - 68%

Option B - 95%

Option C - 99.7%

Option A feedback - Assume that the random variable X denotes the salary of a randomly selected employee.

You have to find $P(₹20,989 < X < ₹18,976)$, which is equal to $P(\mu - \sigma < X < \mu + \sigma)$; and using the 68–95–99.7 rule for a normally distributed data, the value of $P(\mu - \sigma < X < \mu + \sigma)$ is 68%.

Option B feedback - Use the 68–95–99.7 rule to find $P(\mu - \sigma < X < \mu + \sigma)$, where X is a random variable denoting the salary of a randomly selected employee.

4. What is the Z-score for the salary of ₹18,000?
(1 attempt)

Option A - -1.969

Option B - 1.969

Option A feedback - Use the formula $Z = (X_i - \mu) / \sigma = (18,000 - 19983.05) / 1006.908 = -1.969$.

Option B feedback - Use the formula $Z = (X_i - \mu) / \sigma$. Also, remember that X_i is smaller than the mean of the data, so Z cannot be positive.

3.

According to a dataset, the average IQ of humans is 100 with a standard deviation of 15. Answer the following questions based on the information above. (Assume that IQ data is normally distributed.)

Use the Z-table: <http://users.stat.ufl.edu/~athienit/Tables/Ztable.pdf>

1. What is the Z-score for the IQ of 120?

Option A - 2

Option B - 1.33

Option A feedback - Use the formula of Z-score = $\frac{x - \mu}{\sigma}$

Option B feedback - Using the formula of Z-score = $\frac{x - \mu}{\sigma} = (120 - 100)/15 =$

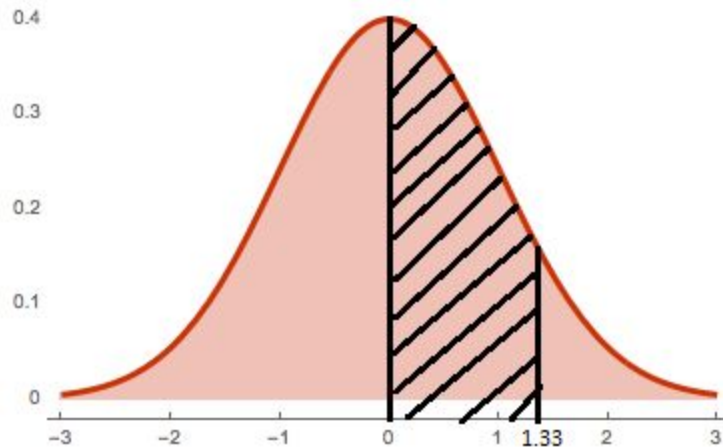
1.33

2. Using Z-table, calculate the probability of a randomly selected person having an IQ between 100 and 120.

Option A - 0.9082

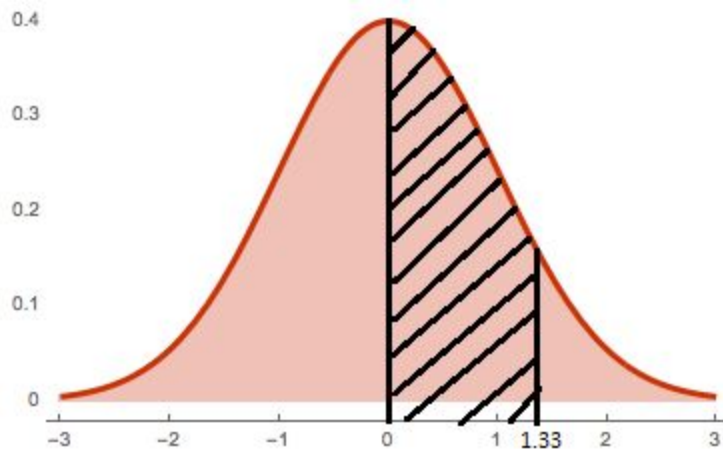
Option B - 0.4082

Option A feedback - You need to find out the area of the shaded region:



Use the Z-table and look at the row of 1.3 and the column of 0.03 to find out the probability.

Option B feedback - You need to find out the area of the shaded region:



Use the Z-table and look at the row of 1.3 and the column of 0.03 to find the value of 0.9082. But, this gives the value of the left half area (0.5) plus the shaded area.

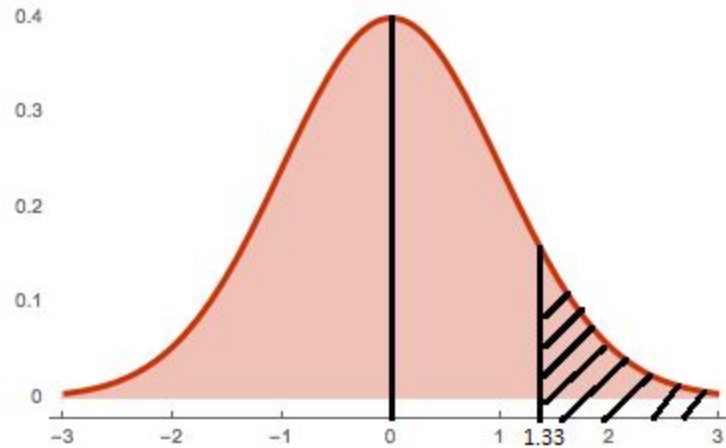
So, the required probability is $0.9082 - 0.5 = 0.4082$.

3. Using Z-table, calculate the probability that a randomly selected person has an IQ greater than 120.

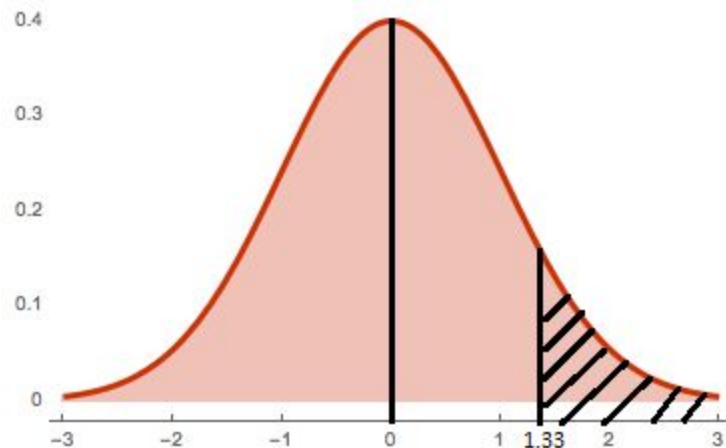
Option A - 0.918

Option B - 0.0918

Option A feedback - You need to find the area of the shaded region:



Option B feedback - You need to find the area of the shaded region:



In the previous question, you had calculated the area of the unshaded portion, which was 0.9082. So, the resultant area is $1 - 0.9082 = 0.0918$.

4. Using Z-table, calculate the probability of a randomly selected person having an IQ less than 80.

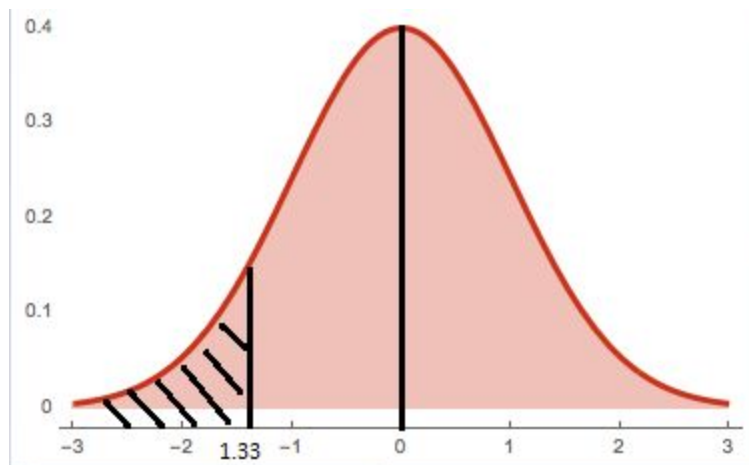
Option A -

Option B -

Option A feedback - Calculate the Z-score and find the required area under the normal distribution curve.

Option B feedback - The Z-score for the IQ of 80 = $(80 - 100) / 15 = -1.33$.

You need to find the area of the shaded region:



Using the row of -1.3 and the column of 0.03, you will get the value of 0.0918. It is the same as the previous question, and it verifies our answer since normal distribution is symmetrical.