C) The  division that has a larger probability of making a loss in a given year is the first division

Ans: **import** numpy **as** np

**from** scipy **import** stats

**from** scipy.stats **import** norm

In [2]:

*# Mean profits from two different divisions of a company = Mean1 + Mean2*

Mean **=** 5**+**7

print('Mean Profit is Rs', Mean**\***45,'Million')

Mean Profit is Rs 540 Million

In [3]:

*# Variance of profits from two different divisions of a company = SD^2 = SD1^2 + SD2^2*

SD **=** np**.**sqrt((9)**+**(16))

print('Standard Deviation is Rs', SD**\***45, 'Million')

Standard Deviation is Rs 225.0 Million

In [4]:

*# A. Specify a Rupee range (centered on the mean) such that it contains 95% probability for the annual profit of the company.*

print('Range is Rs',(stats**.**norm**.**interval(0.95,540,225)),'in Millions')

Range is Rs (99.00810347848784, 980.9918965215122) in Millions

In [7]:

*# B. Specify the 5th percentile of profit (in Rupees) for the company*

*# To compute 5th Percentile, we use the formula X=μ + Zσ; wherein from z table, 5 percentile = -1.645*

X**=** 540**+**(**-**1.645)**\***(225)

print('5th percentile of profit (in Million Rupees) is',np**.**round(X,))

5th percentile of profit (in Million Rupees) is 170.0

In [6]:

*# C. Which of the two divisions has a larger probability of making a loss in a given year?*

In [7]:

*# Probability of Division 1 making a loss P(X<0)*

stats**.**norm**.**cdf(0,5,3)

Out[7]:

0.0477903522728147

In [8]:

*# Probability of Division 2 making a loss P(X<0)*

stats**.**norm**.**cdf(0,7,4)

Out[8]:

0.040059156863817086