In [4]:
```
import pandas as pd
import numpy as np
from scipy import stats
from scipy.stats import norm
```

In [5]:
```
# Mean Profit from the two divisions:profit1 +profit(2) = mean1 +me
mean = 5+7
print('Mean Profit is Rs',mean*45,'Million')
```

```
Mean Profit is Rs 540 Million
```

In [8]:
```
# Standard Deviation from two divisions = Sd1^2 +Sd2^2
sd = np.sqrt(9+16)
print('Standard deviation is Rs',sd*45,'Million')
```

```
Standard deviation is Rs 225.0 Million
```

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

In [9]:
```
print('Range is Rs',(stats.norm.interval(0.95,540,225)),'in Million
```

```
Range is Rs (99.00810347848784, 980.9918965215122) in Millions
```

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

In [12]:
```
# To specify 5th percentile , we have formula X=μ + Zσ
X = 540 + (-1.645 *225)  # From Z _table 5 percentile = -1.645
print('5th percentile of profit (in Rupees) for the company is',np.
```

```
5th percentile of profit (in Rupees) for the company is 170.0
```

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

In [13]:
```
# Probability of making Division1  loss =  P(X<0)
stats.norm.cdf(0,5,3)
```

Out[13]:
```
0.0477903522728147
```

In [14]:
```
# Probability of making Division2 loss = P(X<0)
stats.norm.cdf(0,7,4)
```

Out[14]:
```
0.040059156863817086
```

Inference :

Probablity of Division 1 making a loss in given year than Division 2

In [ ]:
```

```