



# CA Foundation

## Statistics

# Formula Revision Sheets

### Instruction

- ✓ *Get at least 5-10 Print Outs of This Sheet.*
- ✓ *At **Regular Interval** Fill Complete Sheet it will Help You **Retain Formula**.*
- ✓ *Try to Stablish Linking of Formula with Concepts & Questions.*
- ✓ *Try to **add practice of Questions** with Every Revision*

***“Practice leads to perfection and perfection leads to succession”***

*Your Math's Professor*  
Aman Khedia

**Write Down Basic Tricks**

**How to Calculate Any Power**

**How to Calculate Log**

**How to Calculate Antilog**

**Basic Math's Formals**

**Basic Tips**



# Measure of Central Tendency

## All the Formula of Measures of Central Tendency

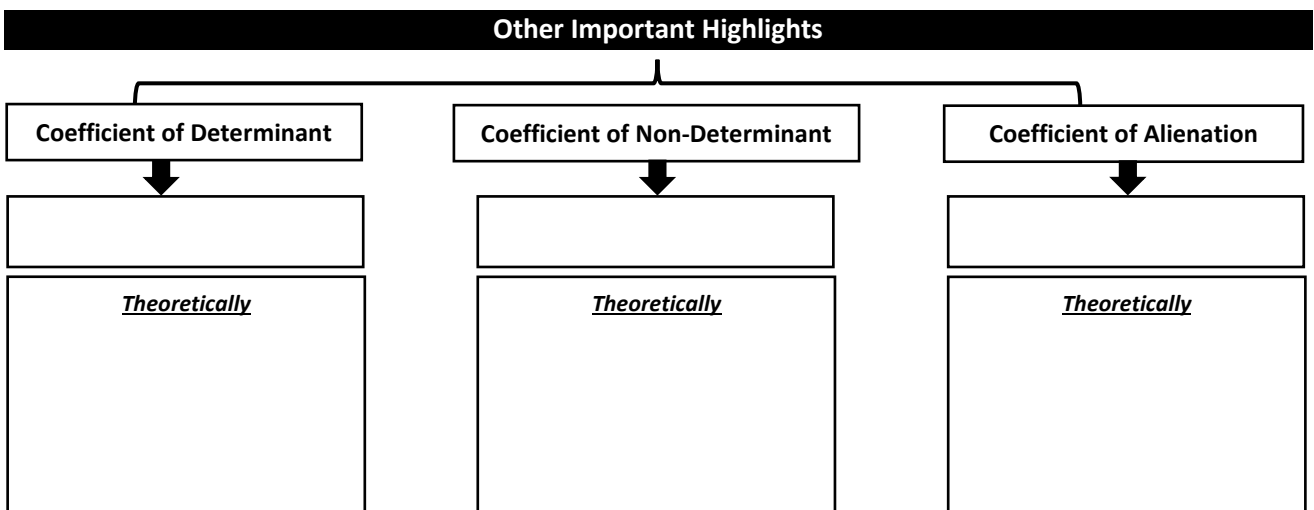
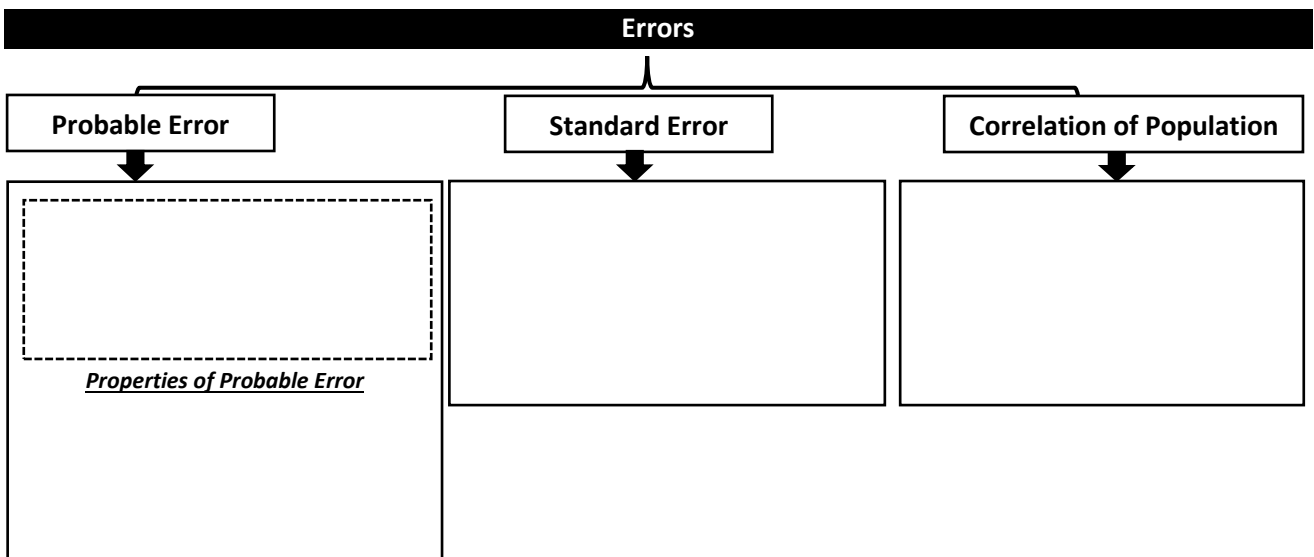
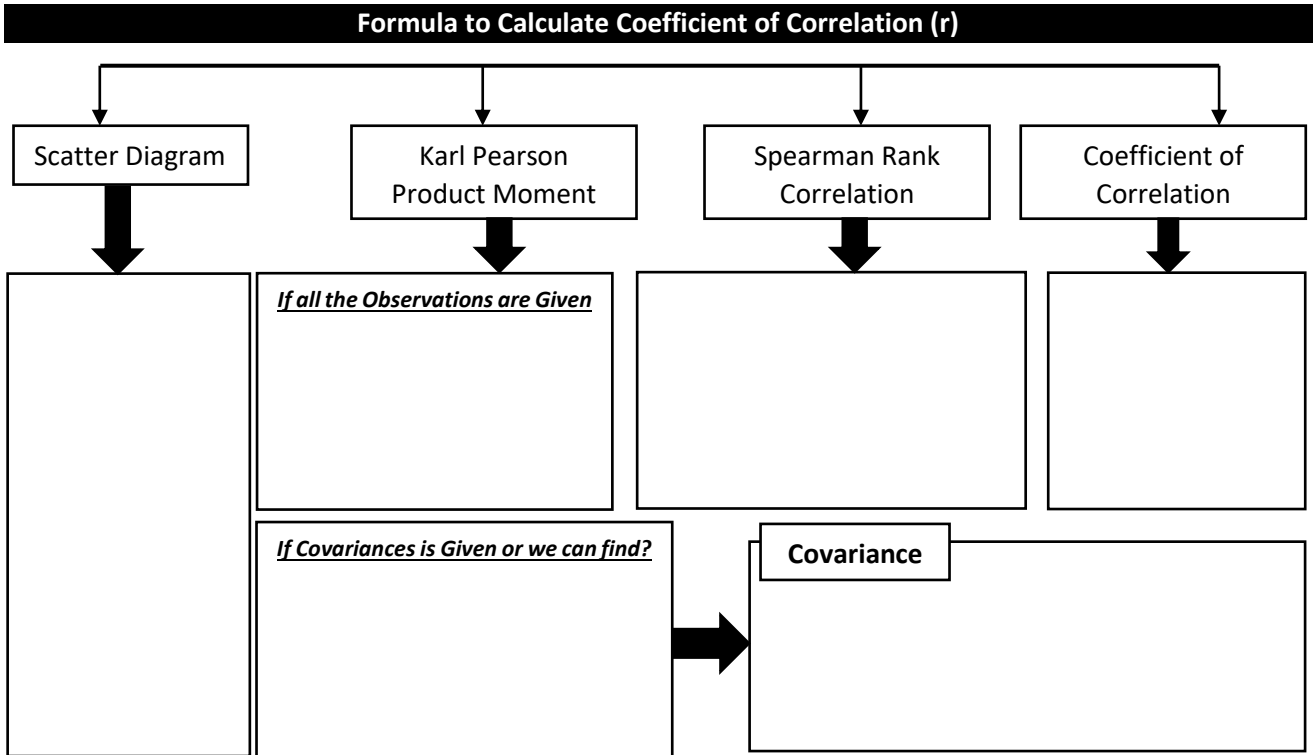
S.no	Particulars	Individual Series	Discrete Series	Continuous Series
1.	Mean			
2.	Patriation Value			
<b>Things to Keep in Mind in PV.</b> (Don't Forget to arrange Data in Ascending Orders 1 <sup>st</sup> )		<u>If Outcome in Decimal?</u>	<u>Where to Check Outcome of Formula?</u>	<u>How to Proceed?</u>
3.	Mode			
4.	Geometric Mean			
5.	Harmonic Mean			
Combined Mean Formula				
S.no	Combined Formula Exist Only for Mean Not for Mode & PV.	Arithmetic Mean	Geometric Mean	Harmonic Mean
1				
Relation Between Mean Median & Mode				
Data Given	Symmetric Data	Asymmetric Data		
	(It means all are Same)	Positively Skewed	Negatively Skewed	Moderately Skewed
Relation Between AM GM & HM				
Data Given	Symmetric Data (It means all are Same)	Asymmetric Data (For the set of <b>Distinct positive</b> observation)		
1.				
2.	If question silent whether data is symmetrical or Asymmetrical:			
Common Property (Scale & Origin)			Refer Page no-	

# Measure of Dispersion

## All the Formula of Measures of Dispersion

S.no	Measure	Absolute Measure	Relative Measure									
1.	Range	<table border="1"> <tr> <td>Individual Series</td> <td></td> <td></td> </tr> <tr> <td>Discrete Series</td> <td></td> <td></td> </tr> <tr> <td>Continuous Series</td> <td></td> <td></td> </tr> </table>	Individual Series			Discrete Series			Continuous Series			
Individual Series												
Discrete Series												
Continuous Series												
2.	Mean Deviation	<table border="1"> <tr> <td>Individual Series</td> <td></td> <td></td> </tr> <tr> <td>Discrete Series</td> <td></td> <td></td> </tr> <tr> <td>Continuous Series</td> <td></td> <td></td> </tr> </table>	Individual Series			Discrete Series			Continuous Series			
Individual Series												
Discrete Series												
Continuous Series												
3.	Quartile Deviation											
4A.	Standard Deviation	<table border="1"> <tr> <td colspan="2">Individual Series</td> </tr> <tr> <td>Direct Method</td> <td></td> </tr> <tr> <td colspan="2">Indirect Method</td> </tr> <tr> <td>Discrete Series</td> <td>Continuous Series</td> </tr> </table>	Individual Series		Direct Method		Indirect Method		Discrete Series	Continuous Series		
Individual Series												
Direct Method												
Indirect Method												
Discrete Series	Continuous Series											
4B.	Variance											
4C.	Combined Standard Deviation											
<b>Mis Point:</b>		M.D of 1 <sup>st</sup> n natural no =	S.D of 1 <sup>st</sup> n natural no =									
<b>Relationship Between QD: MD:SD =</b>												
<b>Common Property (Origin &amp; Scale):</b>			Refer Page no-									

# Correlation Analysis



# Regression Analysis

## Complete Overview & Revision of Chapter

We Need Equation So that we Can Value of One Variable & Get Another Variable

**AIM-3**

**To Estimate the Value**

Equation Formula Use Two Variable One is Regression Coefficient ( $b_{yx}, b_{xy}$ )

**AIM-2**

**Regression Equation**

We Need Equation So that we Can Value of One Variable & Get Another Variable

**AIM-1**

**Regression Coefficient**

**Y on X**

**X on Y**

General Form	General Form
Here <b>a &amp; b</b> are Reg Parameters (Use this Formula When Value of <b>a &amp; b</b> is Given or You can Find)	Here <b>a &amp; b</b> are Reg Parameters (Use this Formula When Value of <b>a &amp; b</b> is Given or You can Find)
Point Form	Point Form
Here ( $b_{yx}$ ) can be Given if Not You have to Calculate Using <b>AIM-1</b> & ( $\bar{X}$ & $\bar{Y}$ ) are Normal Arithmetic Means	Here ( $b_{yx}$ ) can be Given if Not You have to Calculate Using <b>AIM-1</b> & ( $\bar{X}$ & $\bar{Y}$ ) are Normal Arithmetic Means

**Formula**

Students Usually Get Confused When to apply which formula  
(You have to think about formula according to information given in Question)

Given Info	$b_{yx}$	$b_{xy}$
All Obs Given		
SD & r Given		
Cov Given		

- Question:** The regression coefficient of Y on X ( $b_{yx}$ ) of the following data cov.  $(X; Y) = 121$ ;  $\sigma x = 15$ ;  $\sigma y = 14$  is
- Question:** The regression coefficient of X on Y of the following data:  $N = 10$ ;  $\Sigma X = 250$ ;  $\Sigma Y = 210$ ;  $\Sigma(X-25)^2 = 262$ ;  $\Sigma(Y-21)^2 = 322$ ,  $\Sigma(X-25)(Y-21) = 192$  is
- Question:** Find the regression equation from the following data:  
 If  $\Sigma X = 34$ ,  $\Sigma Y = 56$ ,  $\Sigma XY = 351$ ,  $\Sigma X^2 = 234$ ,  $\Sigma Y^2 = 554$ ,  $N = 6$   
 Hence estimate Y when X is 10 and estimate also x when Y is 12.
- (a) 12 & 13                      (b) 12.60 & 15.89  
 (c) 11.76 & 15.30              (d) none of these

### Relationship Between Correlation & Regression

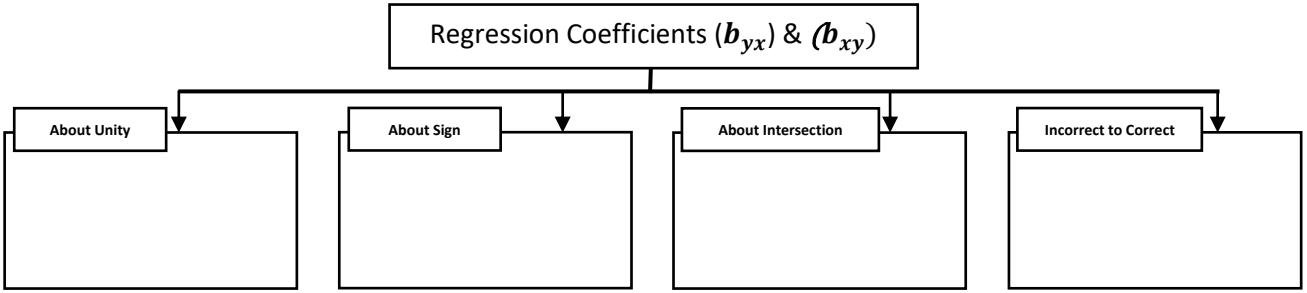
**Practical Formula**

If  $r = \pm 1$  then Regression Lines are

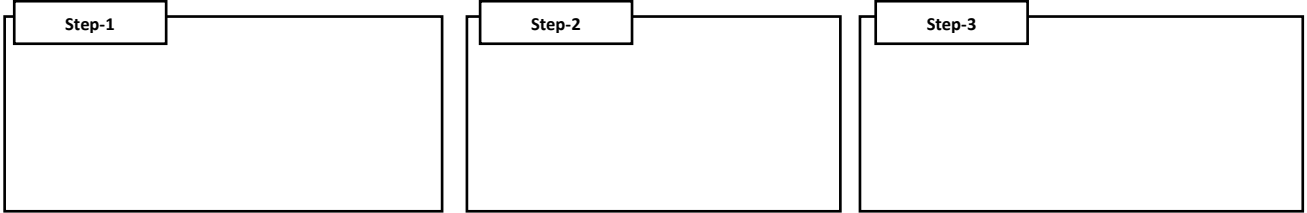
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If  $r = 0$  then Regression Lines are

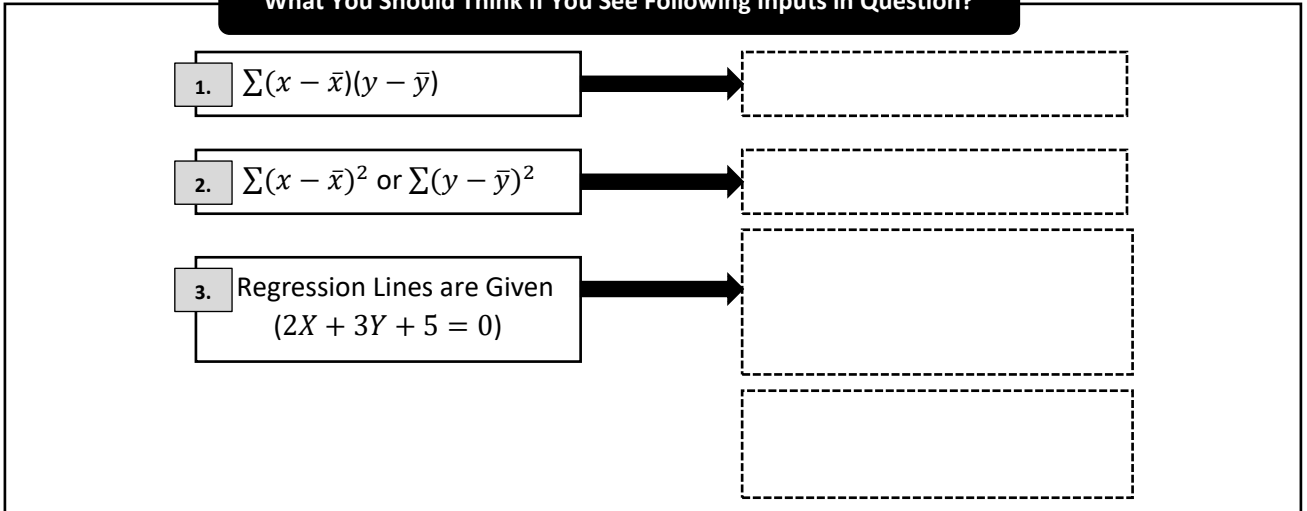
**Important Highlights**



**How to identify Regression Lines**



**What You Should Think If You See Following Inputs in Question?**



**Summary Based Revision Questions**

**Question:** For the variables  $x$  and  $y$ , the regression equation is given as  $7x - 3y - 18 = 0$  and  $4x - y - 11 = 0$

- i. Find the arithmetic means of  $x$  and  $y$ .
- ii. Identify the regression equation of  $y$  on  $x$ .
- iii. Compute the correlation coefficient between  $x$  and  $y$ .
- iv. Given the variance of  $x$  is 9, find the SD of  $y$ .

**Question:** Compute Coefficient of Correlation from following information Regression equation of  $Y$  on  $X$  is  $45X - 5Y + 15 = 0$  and Regression equation of  $X$  on  $Y$  is  $9X - 100Y + 30 = 0$

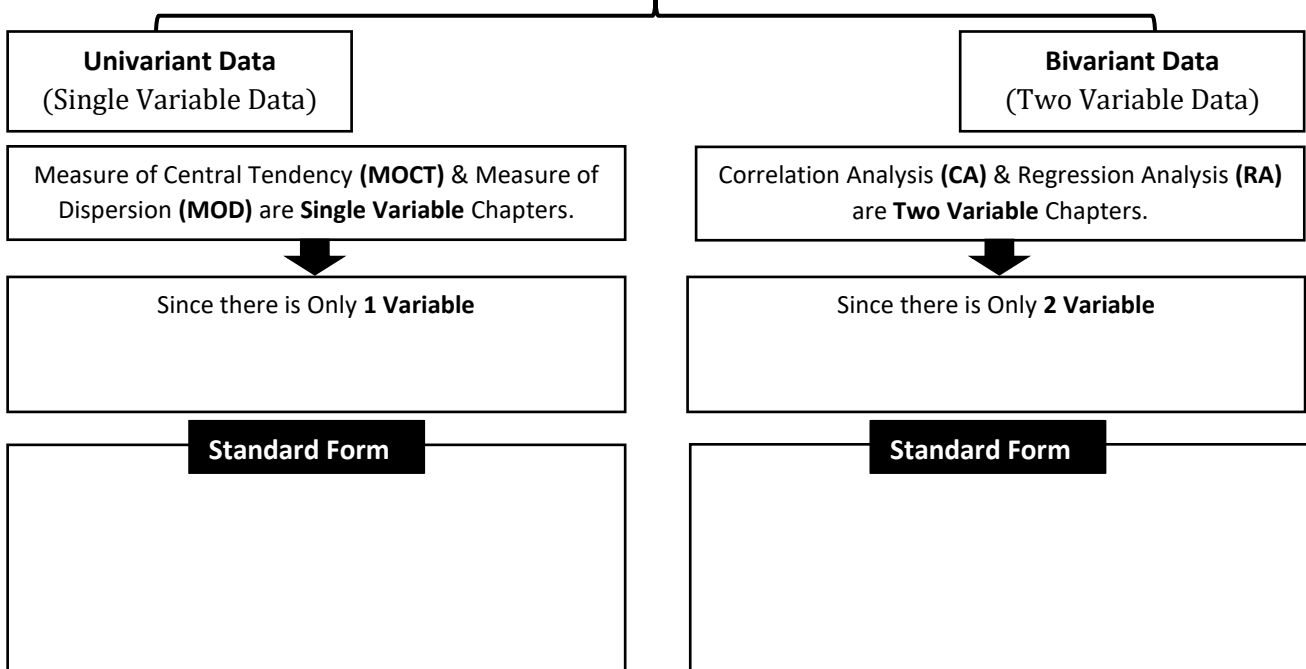
**Question:** If  $\text{Cov}(x, y) = 16$  and Variance of  $x = 25$ , Variance of  $y = 16$  and  $\bar{X} = 20, \bar{Y} = 30$   
Estimate  $Y$  if  $X = 30$

**Question:** If the slope of regression line is calculated to be 5.5 and the intercept 15, then find the value of  $y$  when  $x$  is 6?

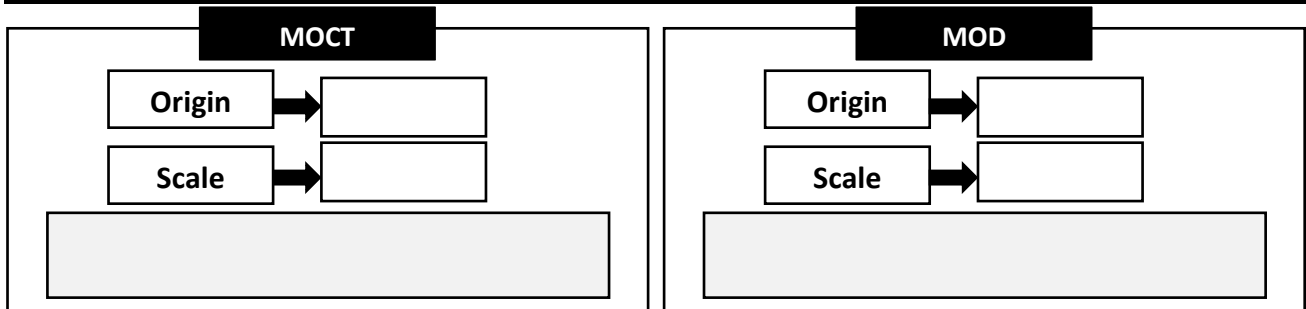
**Question:** If  $Y = 9X$  and  $X = 0.01Y$  then  $r$  is equals to?

## Common Property Summary

Common Property Means **Change** is **Origin & Scale** What Change Will Happen in **(MOCT & MOD)** or **(Correlation & Regression Analysis)** if Observations are Changing by Shifting their Origin & Scale.

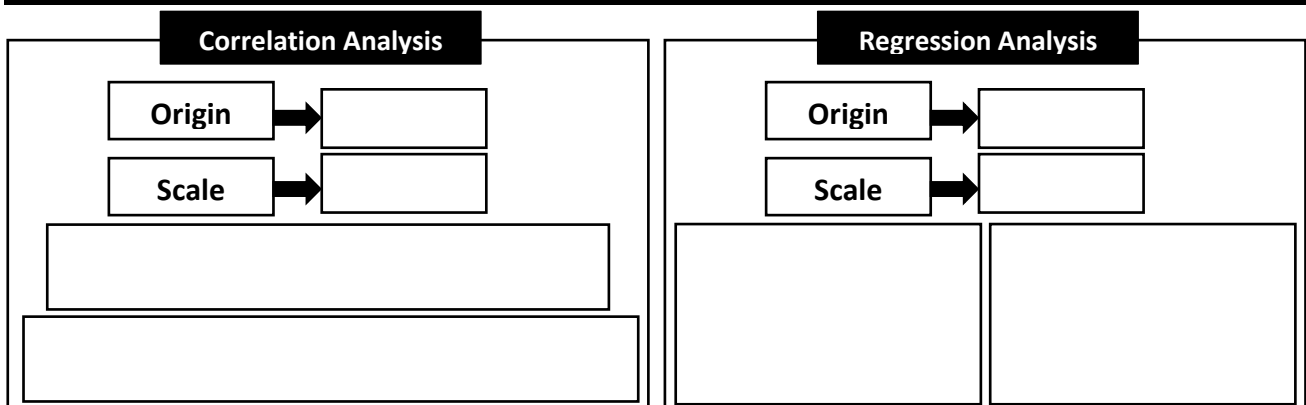


### Measure of Central Tendency & Dispersion



**Question:** If the relationship between x and y is given by  $2x + 3y = 10$  **(a)** And if the Mean of x is Rs 2, what would be the Mean of y? **(b)** And if range of x is Rs 15, what would be the range of y?

### Correlation Analysis & Regression Analysis



**Question:** If  $u + 5x = 6$  and  $3y - 7v = 20$  and the correlation coefficient between x and y is 0.58 then what would be the correlation coefficient between u and v?

**Question:** If  $u = 2x + 5$  and  $v = -3y - 6$  and regression coefficient of y on x is 2.4, what is the regression coefficient of v on u?