

# APPLIED MECHANICS PRACTICAL RECORD

EXPERIMENT NO. \_\_\_\_\_

DATE: \_\_\_\_\_

**OBJECTIVE:** To study various equipment related to Engineering Mechanics.

## 1. SIMPLE MACHINES

APPARATUS: \_\_\_\_\_

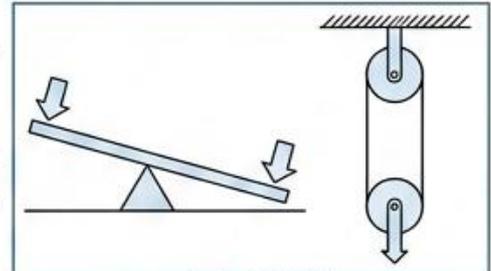
THEORY/DESCRIPTION:

\_\_\_\_\_

PROCEDURE:

\_\_\_\_\_

OBSERVATIONS:



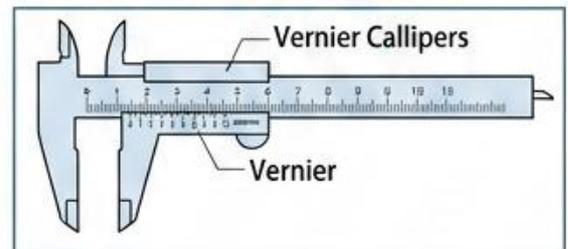
## 2. MEASURING INSTRUMENTS

APPARATUS: \_\_\_\_\_

DESCRIPTION OF VERNIER CALLIPERS AND MICROMETER SCREW GAUGE:

\_\_\_\_\_

LEAST COUNT CALCULATION:



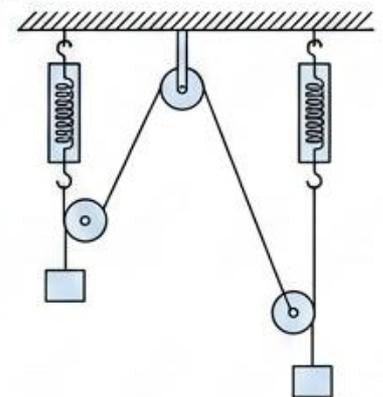
## 3. FORCE AND TORQUE APPARATUS

APPARATUS (e.g., Triangle of Forces, Parallelogram of Forces):

WORKING PRINCIPLE:

SAMPLE READINGS TABLE (e.g, for Triangle of Forces):

Weight 1 (P)	Weight 2 (Q)	Resultant (R)	Measured Angles



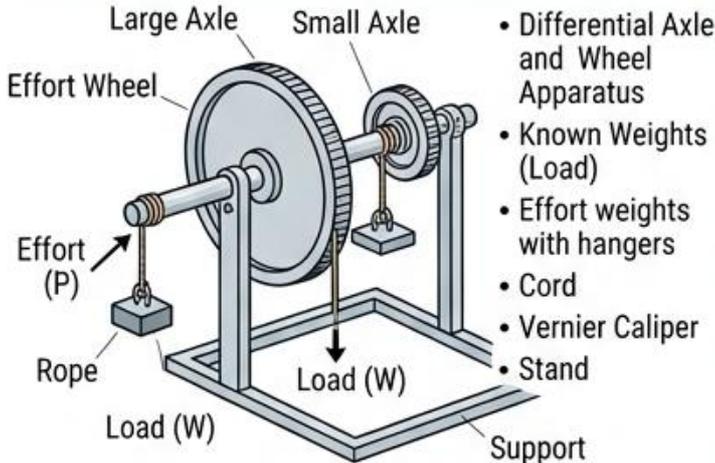
# APPLIED MECHANICS PRACTICAL GUIDE

DATE / /

EXPERIMENT NO.

**OBJECTIVE:** To find the Mechanical Advantage (M.A.), Velocity Ratio (V.R.), Efficiency, and Law of Machine for a Differential Axle and Wheel.

## 1 EXPERIMENTAL SETUP & APPARATUS



## 2 PROCEDURE & MEASUREMENTS

- Step 2a:** Setup the apparatus securely.
- Step 2b:** Measure diameters:
  - D (Effort Wheel)
  - d<sub>1</sub> (Large Axle)
  - d<sub>2</sub> (Small Axle). Record values.
- Step 2c:** Apply load (W) and record required effort (P).
- Step 2d:** Repeat for different loads (5 or 6 trials). Ensure the load is lifted uniformly.

## 3 OBSERVATIONS & DATA RECORD

S.No.	Load (W) (N)	Effort (P) (N)	Lifted Height (h) (m)
1			
2			
3			
4			
5			
6			

## 4 CALCULATIONS

$$D = D_1, d_1, d_2 = d_2$$

Effort Moved Distance (d) (m)	M.A. = $\frac{W}{P}$	V.R. = $\frac{D}{d_1 - d_2}$
-------------------------------	----------------------	------------------------------

KEY FORMULAS:

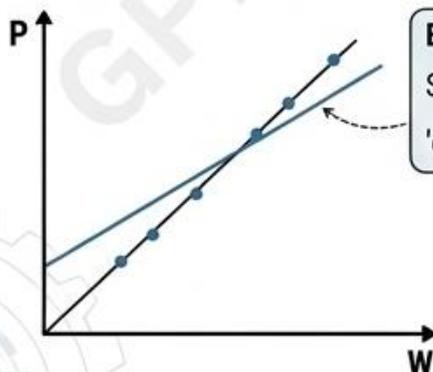
$$\text{M.A.} = \frac{\text{Load (W)}}{\text{Effort (P)}}$$

$$\text{V.R.} = \frac{\text{Circumference of Effort Wheel}}{\text{Difference of circumferences of axles}} = \frac{\pi D}{\pi d_1 - \pi d_2} = \frac{D}{d_1 - d_2}$$

$$\text{Efficiency } (\eta) = \frac{\text{Output Work}}{\text{Input Work}} = \frac{\text{M.A.}}{\text{V.R.}} \times 100$$

$$\text{Law of Machine: } P = mW + c$$

## 5 GRAPH & ANALYSIS



**Example:**  
 Slope (m) =  $\frac{\Delta P}{\Delta W}$   
 'c' = P-intercept

- How to calculate graph to calculate 'm' and are 'c' from the graph.
- How to calculate the equations, m and c' arreet m from the graph.

**Example:**

$$\begin{aligned} \text{Law of Machine equation : } P &= mW + c \\ &= \text{cattiemer graph} \\ &= \text{Slope} = (m / \cdot c_s) * 100 \\ &= c = \text{constant} \end{aligned}$$

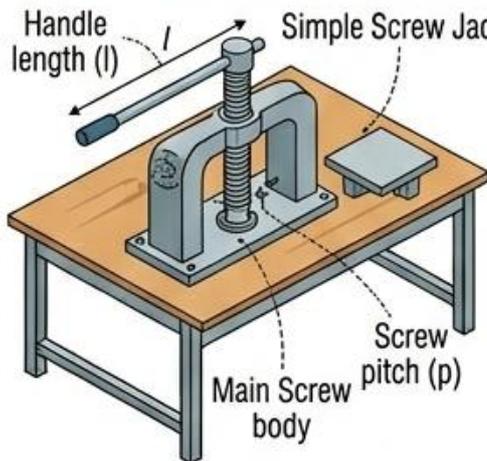
# SIMPLE SCREW JACK EXPERIMENT GUIDE

DATE / /

EXPERIMENT NO.

**OBJECTIVE:** To find the M.A., V.R., Efficiency, and Law of Machine for Simple Screw Jack.

## 1 APPARATUS STUDY & TYPES



• **STUDY APPARATUS TYPES**

• **FORCES & TORQUE**

• **SCREW JACK MODELS**

• **EFFORT MEASUREMENT**

## 2 MEASUREMENT & FUNDAMENTALS



**Step 2a: STUDY** Measurement scales on screw jack and weights.



**Step 2b: IDENTIFY** key parameters and units. (e.g., Load in N, Effort in N).



**Step 2c: OBSERVE** component interactions (Handle rotation vs Load lift).



**Step 2d: RECORD** initial readings from diverse equipment (Initial load, effort for no load).

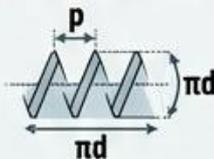
## 3 OBSERVATIONS & DATA COLLECTION

S.No.	APPARATUS NAME	PARAMETERS STUDIED	MEASUREMENT TOOL USED	OBSERVATIONS	UNCERTAINTIES
1	Screw Jack	Load (W), Effort (P)	Vernier	Text for data	
2	<b>W (N)</b>	<b>P (N)</b>	Weights	Text for data	
3	20	5			
4	40	8			
5	60	11			
6	80	14			
	100	17			
	120	20			

## 4 KEY CONCEPTS & THEORIES



**SCREW MECHANISM**



**WORK DONE BY EFFORT**



**EFFICIENCY ( $\eta$ )**

$$\eta = \frac{R}{\sin A + c}$$



**LAW OF MACHINE**

$$P = mW + c$$



**MECHANICAL ADVANTAGE (M.A.)**

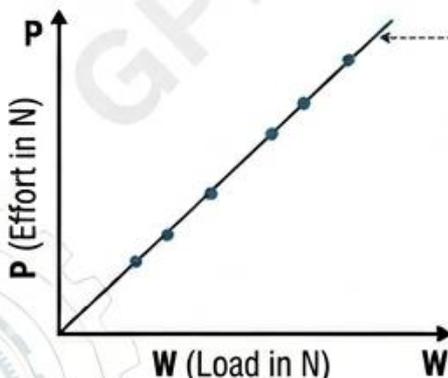
$$M.A. = \frac{W}{P}$$



**VELOCITY RATIO**

$$V.R. = \frac{2\pi l}{p}$$

## 5 DATA PROCESSING & RESULTS



**Example:**  $P = mW + c$

**Example:**

$$\text{Slope (m)} = \frac{\Delta P}{\Delta W}$$

From graph:  $\Delta P = 3N$ ,  $\Delta W = 20N$

$$m = 3/20 = 0.15$$

P-intercept (c) = 2N

$$\text{Law of Machine: } P = 0.15W + 2$$

• How to **FORCE (F)** vs example for different machines.

• How to text ananiters for different machines.

**General results for**

• M.A. (average) = \_\_\_

• V.R. (measured) = \_\_\_

• Efficiency (max) = \_\_\_

• Law of Machine:  $P = mW + c$

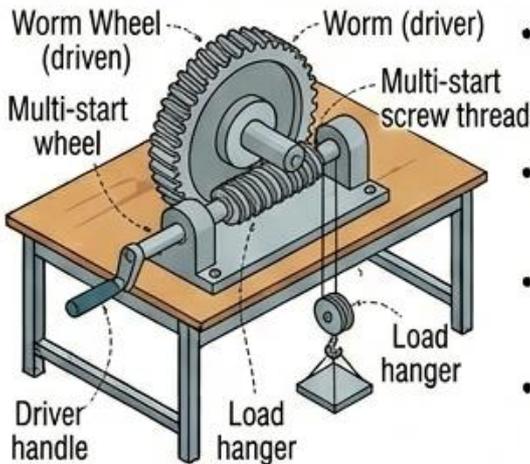
# WORM & WORM WHEEL EXPERIMENT GUIDE

DATE / /

EXPERIMENT NO.

**OBJECTIVE:** To derive the Law of Machine using a Worm and Worm Wheel.

## 1 APPARATUS STUDY & TYPES



- STUDY APPARATUS TYPES
- WORMS & GEARS
- WORM WHEEL MODELS
- EFFORT MEASUREMENT

## 2 MEASUREMENT & FUNDAMENTALS



**Step 2a: STUDY** Measurement scales on worm apparatus.



**Step 2b: IDENTIFY** key parameters and units (e.g., Load in N, Effort in N, No. of threads).



**Step 2c: OBSERVE** component interactions (Handle rotation and worm movement).



**Step 2d: RECORD** initial readings from diverse equipment (e.g., initial no-load effort).

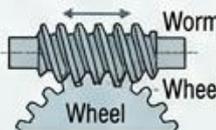
## 3 OBSERVATIONS & DATA COLLECTION

S.No.	APPARATUS NAME	PARAMETERS STUDIED	MEASUREMENT TOOL USED	OBSERVATIONS	UNCERTAINTIES
1	Worm & Wheel	Load (W), Effort (P)	Weights	Text for data	
2	W (N)	P (N)	Weights	Text for data	
3	50	12			
4	100	20			
5	150	28			
6	200	36			

## 4 KEY CONCEPTS & THEORIES



**WORM GEAR MECHANISM**



**VELOCITY RATIO (V.R.)**

$$V.R. = \frac{N}{n}$$

N = wheel teeth  
n = worm starts



**MECHANICAL ADVANTAGE (M.A.)**

$$M.A. = \frac{W}{P}$$

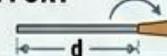


**EFFICIENCY ( $\eta$ )**

$$\eta = \frac{R}{\sin A + c}$$



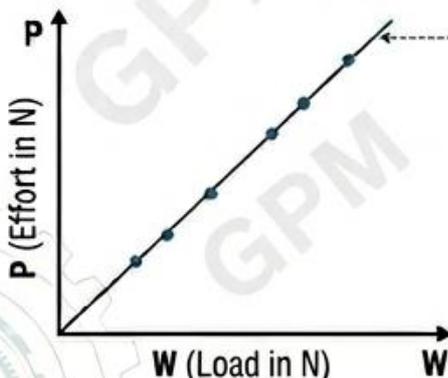
**WORK DONE BY EFFORT**



**LAW OF MACHINE**

$$P = mW + c$$

## 5 DATA PROCESSING & RESULTS



**Example:**  $P = mW + c$

**Example:**

$$\text{Slope (m)} = \frac{\Delta P}{\Delta W}$$

From graph:  $\Delta P = 16N$ ,  $\Delta W = 100N$

$$m = 16/100 = 0.16$$

P-intercept (c) = 4N

$$\text{Law of Machine: } P = 0.15W + 4$$

General results for equipment study:

- Summarize key findings
- Explain worm function
- Determine system relations

**General results for**

- M.A. (average) = \_\_\_\_\_
- V.R. (calculated) = \_\_\_\_\_
- Efficiency (max) = \_\_\_\_\_
- Law of Machine:  $P = mW + c$

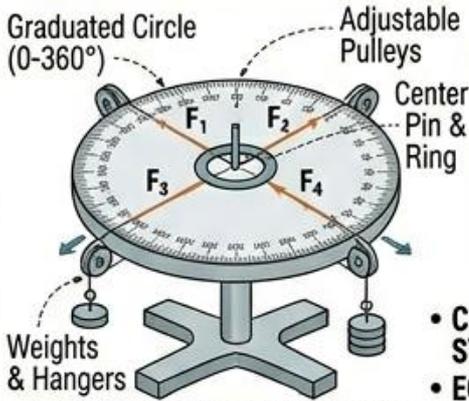
# POLYGON LAW OF FORCES EXPERIMENT GUIDE

DATE / /

EXPERIMENT NO.

**OBJECTIVE:** To determine the resultant of a concurrent force system applying the Law of Polygon of forces using a force table.

## 1 APPARATUS STUDY & TYPES



- Study the Force Table and pulleys
- Adjustable angular positions
- Apply loads via hangers
- Observe equilibrium condition

- GRADUATED TABLE & PULLEYS
- CONCURRENT FORCE SYSTEM

- CONCURRENT FORCE SYSTEM
- EQUILIBRIUM OBSERVATION
- ANGLE MEASUREMENT

## 2 MEASUREMENT & FUNDAMENTALS



**Step 2a: CHECK** Graduated scales on table and weights.



**Step 2b: IDENTIFY** applied forces (Weights) and their directions (Angles).



**Step 2c: OBSERVE** the central pin position. Adjust loads and angles for equilibrium.



**Step 2d: RECORD** forces and angle readings from the table.

## 3 OBSERVATIONS & DATA COLLECTION

S.No.	APPARATUS NAME	PARAMETERS STUDIED	MEASUREMENT TOOL USED	OBSERVATIONS	UNCERTAINTIES
S.No.	Force Table	Mag (N)	Angle ( $\theta^\circ$ )	Text for data	
1	$F_1$	10	0		Graduated Pulleys
2	$F_2$	15	60		
3	$F_3$	12	140		
4	$F_4$	10	240		
Experimental Resultant		—	—	—	—
Theoretical Resultant		—	—	—	—

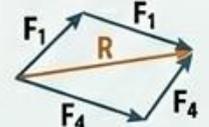
## 4 KEY CONCEPTS & THEORIES



**CONCURRENT FORCES**



**LAW OF POLYGON OF FORCES**



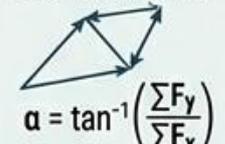
**VECTOR RESOLUTION**

$$\sum F_x = \sum F_i \cos \theta_i$$

$$\sum F_y = \sum F_i \sin \theta_i$$

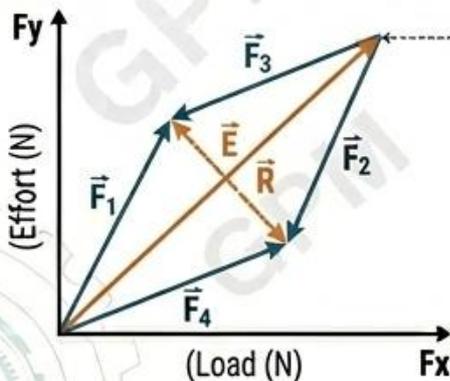
$$R = \sqrt{\sum F_x^2 + \sum F_y^2}$$

**Lami's Theorem**



- **Polygon of Forces:** Definition of the law as Force System and Polgon.
- **Resultant (R):** Vector sum
- **Equilibrant (E):** Vector equal and opposite to R

## 5 DATA PROCESSING & RESULTS



### FORCE POLYGON PLOT

**Example:**

$$\sum F_x = (10, - \sum F_1 = 10)$$

$$\sum F_y = (15, - \sum F_y = 60)$$

$$R_{\text{theo}} = (16N, + (240) = 100N)$$

$$\alpha_{\text{theo}} = \sqrt{\sum F_x^2 + \sum F_y^2}$$

$$\alpha_{\text{theo}} = \tan^{-1} \left( \frac{\sum F_y}{\sum F_x} \right)$$

- Check for equilibrium condition
- Compare experimental & theoretical R
  - Determine system relations

**Result**

- **Experimental Resultant** (Mag = \_\_, Angle = \_\_)
- **Theoretical Resultant** (Mag = \_\_, Angle = \_\_)
- **Percentage Error** (Magnitude = \_\_%, Direction = \_\_%)

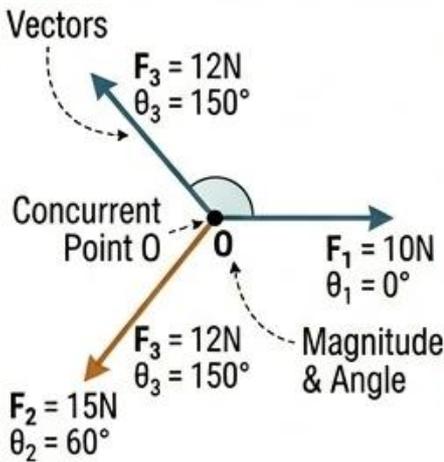
# CONCURRENT FORCE SYSTEM GRAPHICAL GUIDE

DATE / /

EXPERIMENT NO.

**OBJECTIVE:** To determine the resultant of a concurrent force system graphically.

## 1 VECTOR SYSTEM & FUNDAMENTALS



- DEFINE CONCURRENT VECTORS
- IDENTIFY KEY VALUES
- PREPARE GRAPHICAL DATA
- NOTE MEASUREMENT UNITS

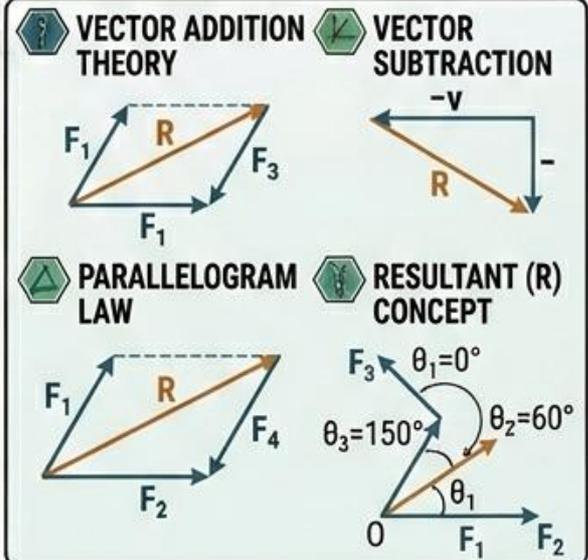
## 2 GRAPHICAL PREPARATION & FUNDAMENTALS

- Step 2a: SELECT** an appropriate vector scale (e.g., 1 cm = 2 N).
- Step 2b: PREPARE** graph paper and drawing tools (Ruler, Protractor).
- Step 2c: SET** concurrent point 'O' on the graph paper.
- Step 2d: RECORD** scale and initial vector data.

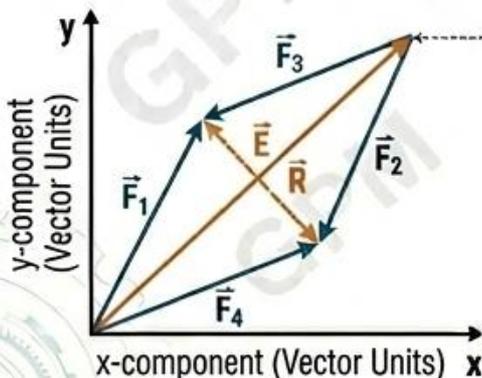
## 3 OBSERVATIONS & DATA COLLECTION

S.No.	APPARATUS NAME	PARAMETERS STUDIED	MEASUREMENT TOOL USED	OBSERVATIONS	UNCERTAINTIES
S.No.	Graph Paper	Mag (N)	Angle ( $\theta^\circ$ )	Text for data	
1	Generic Force	10	0	Description	—
2	Generic Force	15	60	Description	—
3	Generic Force	12	150	Description	—
4	—	—	—	Description	—
Experimental Resultant			—	—	—
Theoretical Resultant			—	—	—

## 4 KEY CONCEPTS & THEORIES



## 5 DATA PROCESSING & RESULTS



### PARALLELOGRAM PLOT

**Example:**

Resultant Mag (N) =  
 Direction ( $\theta^\circ$ ) =  
 $R_{\text{resultant}} = 22\text{N}$   
 $R_{\text{resultant}} = 22\text{N}, \theta_{\text{resultant}} = 36^\circ$   
 $\theta_{\text{resultant}} = 36^\circ$

- Summarize key findings
- Explain vector function
- Determine system relations

### Experimental result

- Graphically Derived Resultant (Mag = \_\_, Angle = \_\_)
- **Percentage Error**  
Graphical Precision (1-10)

# PARALLEL FORCE SYSTEM GRAPHICAL GUIDE

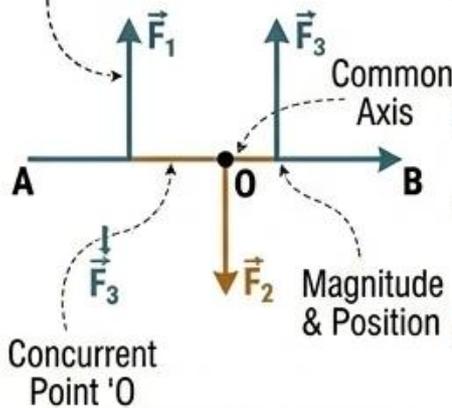
DATE / /

EXPERIMENT NO.

**OBJECTIVE:** To determine the resultant of a parallel force system graphically.

## 1 VECTOR SYSTEM & FUNDAMENTALS

Vectors



DEFINE PARALLEL VECTORS



IDENTIFY KEY VALUES



PREPARE GRAPHICAL DATA



NOTE MEASUREMENT UNITS

## 2 GRAPHICAL PREPARATION & FUNDAMENTALS



**Step 2a: SELECT** an appropriate vector scale (e.g., 1 cm = 2 N).



**Step 2b: PREPARE** graph paper and drawing tools (Ruler, Protractor/Compass).



**Step 2c: SET** reference lines and axis on the graph paper.



**Step 2d: RECORD** scale and initial vector data.

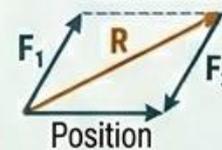
## 3 OBSERVATIONS & DATA COLLECTION

S.No.	APPARATUS NAME	PARAMETERS STUDIED	MEASUREMENT TOOL USED	OBSERVATIONS	UNCERTAINTIES
S.No.	Graph Paper	Mag (N)	Position (cm)	Text for data	
1	Generic Force	10	0	Description	—
2	Generic Force	15	12	Description	—
3	Generic Force	12	20	Description	—
4	—	—	—	Description	—
Experimental Resultant			—	—	—
Theoretical Resultant			—	—	—

## 4 KEY CONCEPTS & THEORIES



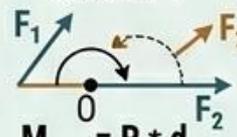
RESULTANT (R) CONCEPT



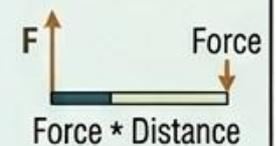
VECTOR RESOLUTION CONCEPT



VARIGNON'S THEOREM CONCEPT

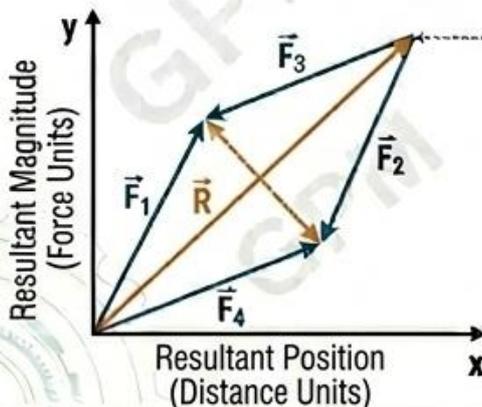


MOMENT THEORY



$M_{sum} = R * d$   
d being position of resultant R

## 5 DATA PROCESSING & RESULTS



RESULTANT POSITION (Varignon's Theorem)

Example:

Resultant Mag (N) =

Position (8cm) =

$R_{resultant} = 22N$

$R_{resultant} = 22N, d_{resultant} = 80^\circ$

$d_{resultant} = 8cm$

- Summarize key findings
- Explain parallel function
- Determine system relations

**Experimental result**

- Graphically Derived Resultant (Mag = \_\_, Position = \_\_)

• **Percentage Error**

Graphical Precision (1-10)

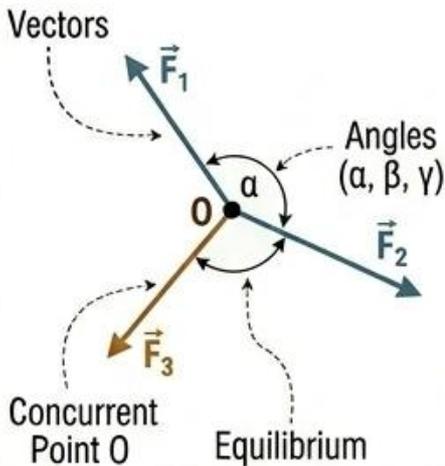
# LAMI'S THEOREM VERIFICATION GUIDE

DATE / /

EXPERIMENT NO.

**OBJECTIVE:** To verify Lami's Theorem.

## 1 VECTOR SYSTEM & FUNDAMENTALS



- DEFINE CONCURRENT VECTORS** (at a single point)
- IDENTIFY KEY VALUES** (Mag. & Angles)
- PREPARE GRAPHICAL DATA** (or tabular data for calculation)
- NOTE MEASUREMENT UNITS** (Force, Degree)

## 2 MEASUREMENT & FUNDAMENTALS

- Step 2a:** Setup concurrent forces on a force table or with spring balances.
- Step 2b:** Measure force magnitudes and corresponding angles.
- Step 2c:** Ensure the system is in static equilibrium (no movement).
- Step 2d: RECORD** initial and measured force data.

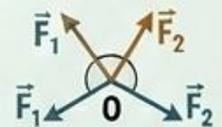
## 3 OBSERVATIONS & DATA COLLECTION

S.No.	APPARATUS NAME	PARAMETERS STUDIED	MEASUREMENT TOOL USED	OBSERVATIONS	UNCERTAINTIES
S.No.	Force Table	Mag (N) Angle $\theta_i$	Angle $\theta_i$ ( $^\circ$ )	Text for data	
1	Force $F_1$	10	120	Description	—
2	Force $F_2$	15	120	Description	—
3	Force $F_3$	12	120	Description	—
4	Force $F_3$	12	120	Description	—
<b>Experimental Resultant</b>			—	—	—
<b>Theoretical Resultant</b>			—	—	—

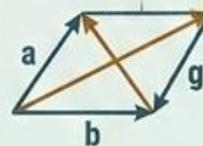
## 4 KEY CONCEPTS & THEORIES

**LAMI'S THEOREM CONCEPT** **EQUILIBRIUM FORCES**

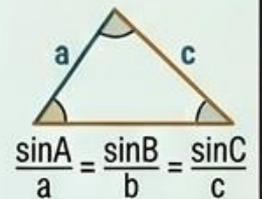
$$\frac{P}{\sin \alpha} = \frac{Q}{\sin \beta} = \frac{R}{\sin \gamma}$$



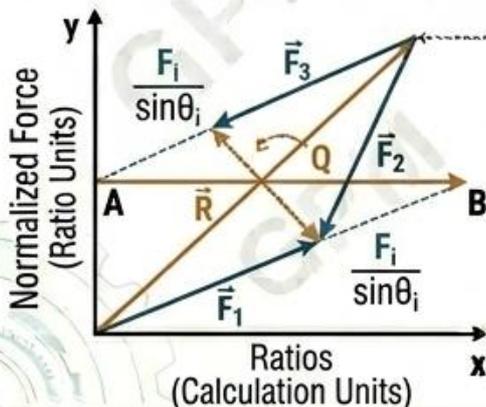
**VECTOR ADDITION THEORY**



**SINE LAW CONCEPT**



## 5 DATA PROCESSING & RESULTS



### LAMI'S THEOREM PLOT

**Example:**

$$\text{Ratio Mag (N/sin)} = \frac{\text{Ratio}}{\sin \gamma}$$

$$R_1 = R_2 = R_3 =$$

$$R_{\text{resultant}} = \frac{22\text{N}}{\sin \alpha} = \frac{22\text{N}}{\sin \beta} = \frac{22\text{N}}{\sin \gamma}$$

$$\text{Ratio}_{\text{calculated}} = 15.6$$

- Summarize key findings
- Explain theorem function
- Determine ratio relations

### Experimental result

- Graphically Derived Ratio (Mag = \_\_, Ratio = \_\_)

### Percentage Error

Verification Error (1-10)

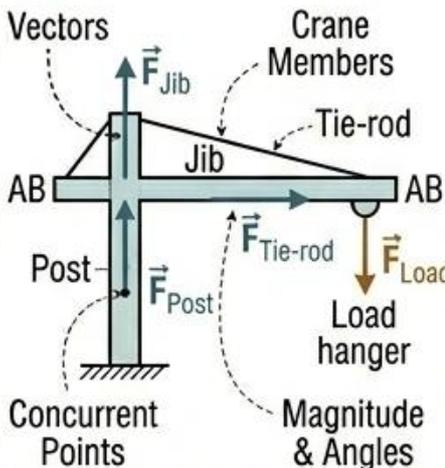
# JIB CRANE FORCES EXPERIMENT GUIDE

DATE / /

EXPERIMENT NO.

**OBJECTIVE:** To study forces in various members of a Jib crane.

## 1 VECTOR SYSTEM & FUNDAMENTALS



- DEFINE CONCURRENT VECTORS** (at a single point)
- IDENTIFY KEY VALUES** (Mag. & angles on members)
- PREPARE TABULAR DATA** (or specific data for calculation)
- NOTE MEASUREMENT UNITS** (Force, Degree)

## 2 MEASUREMENT & FUNDAMENTALS



**Step 2a:** Set up the Jib crane apparatus securely on a table.



**Step 2b:** Identify and check spring balances for zero error.



**Step 2c:** Attach different loads to the load hanger and measure forces in members (e.g., tie-rod).



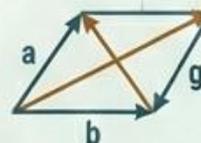
**Step 2d: RECORD** initial and measured force data from spring balances.

## 3 OBSERVATIONS & DATA COLLECTION

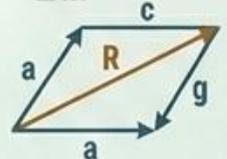
S.No.	APPARATUS NAME	PARAMETERS STUDIED	MEASUREMENT TOOL USED	OBSERVATIONS	UNCERTAINTIES
S.No.	Jib Crane	Vector ( $F_i$ ) Angle $\theta_i$	Angle $\theta_i$ ( $^{\circ}$ )	Text for data	
1	Tie-rod	10	45	Description	—
2	Jib	15	60	Description	—
3	Post	12	90	Description	—
4	—	—	—	Description	—
Experimental Resultant			—	—	—
Theoretical Resultant			—	—	—

## 4 KEY CONCEPTS & THEORIES

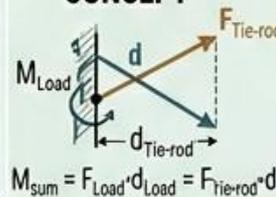
**VECTOR ADDITION THEORY**



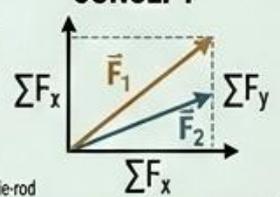
**PARALLELOGRAM LAW**



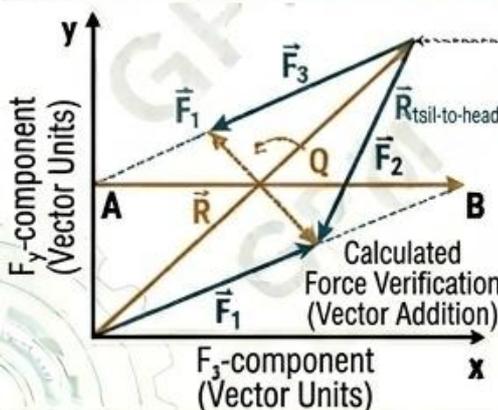
**VARIGNON'S THEOREM CONCEPT**



**FORCE RESOLUTION CONCEPT**



## 5 DATA PROCESSING & RESULTS



### JIB CRANE FORCES PLOT

**Example:**

$$\sum F_x (N) = \sum F_i \cos \theta_i = \sum F_i \cos 45$$

$$= F_1 \cos 45 + F_2 \cos 60 + F_3 \cos 90$$

$$\sum F_y (N) = \sum F_i \sin \theta_i$$

$$= F_1 \cos 45 + F_2 \sin \theta, \sum F_y = 15.6N$$

$$R = \sqrt{\sum F_x^2 + \sum F_y^2} = 15.6N$$

- Summarize key findings
- Explain force function
- Determine system relations

### Experimental result

• Graphically Derived Resultant (Mag = \_\_, Angle = \_\_)

### Percentage Error

Force Precision (1-10)



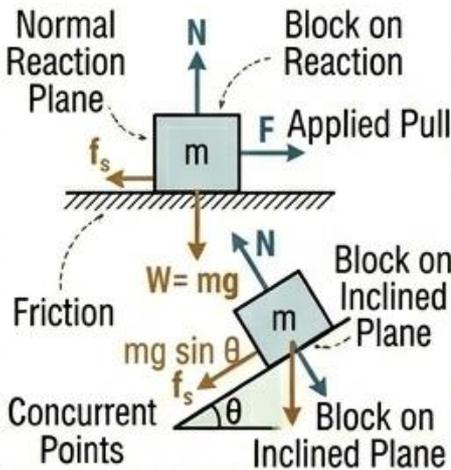
# FRICTION COEFFICIENT EXPERIMENT GUIDE

DATE / /

EXPERIMENT NO.

**OBJECTIVE:** To determine the coefficient of friction for motion on horizontal and inclined plane.

## 1. FRICTION SYSTEM & FUNDAMENTALS



- DEFINE FRICTION TYPES** (Static vs. Kinetic)
- IDENTIFY KEY VALUES** (Mass, Angles)
- PREPARE TABULAR DATA** (or graphical data for calculation)
- NOTE MEASUREMENT UNITS** (Force, Degree)

## 2. MEASUREMENT & FUNDAMENTALS

- Step 2a:** Set up the horizontal or inclined plane apparatus.
- Step 2b:** Setup point loads F, or increment angle  $\theta$ , etc., to initiate motion.
- Step 2c:** Attach load measurement tools (e.g., spring balances or load cells).
- Step 2d: RECORD** initial and measured force or angle data.

## 3. OBSERVATIONS & DATA COLLECTION

S.No.	APPARATUS NAME	PARAMETERS STUDIED	MEASUREMENT TOOL USED	OBSERVATIONS	UNCERTAINTIES
S.No.	Friction Plane	Normal Force (N) Friction ( $f_s$ )	Distance (cm)	Text for data	
1	Generic Force (Pull on Horizontal)	10	—	Description	—
2	Generic Force (Pull on Horizontal)	15	—	Description	—
3	Generic Angle (on inclined)	—	12	Distance $\theta$ (°)	Initial slippage
4	Generic Angle (on inclined)	—	16	Distance $\theta$ (°)	Initial slippage
<b>Experimental Resultant</b>			—	—	—
<b>Theoretical Resultant</b>			—	—	—

## 4. KEY CONCEPTS & THEORIES

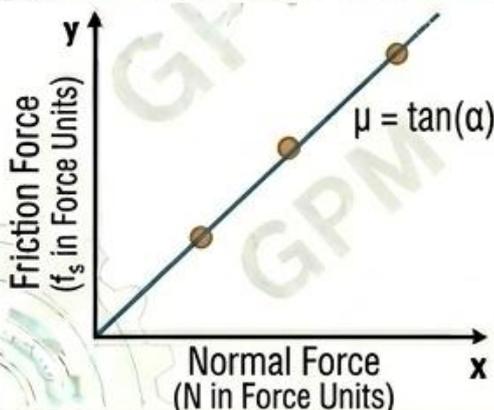
**FORCES RESOLUTION**

**FRICTION THEORY**

**INCLINED PLANE EQUILIBRIUM**

**STATIC FRICTION LAW**

## 5. DATA PROCESSING & RESULTS



### MOMENT CALCULATION Graphical Construction A

**Example:**  
 $\sum F_x (N) = F - f_s = 0$ ,  
 Ratios with illustrative values.  
 $\mu_{\text{calculated}} = \tan(\alpha)$  re ratios  
 Calculated construction ratio.  
 Calculated ratio value value value  
 All calculation example are illustrative.

- Summarize key findings
- Explain friction types
- Determine friction coefficients

### Result Summary

- Graphically Derived  $\mu$  (Horizontal) = \_
- Inclinator-Derived  $\mu$  (Inclined) = \_
- **Percentage Error**
- Friction Coefficient Precision (1-10)

# GEOMETRICAL PLANE FIGURE CENTROID GUIDE

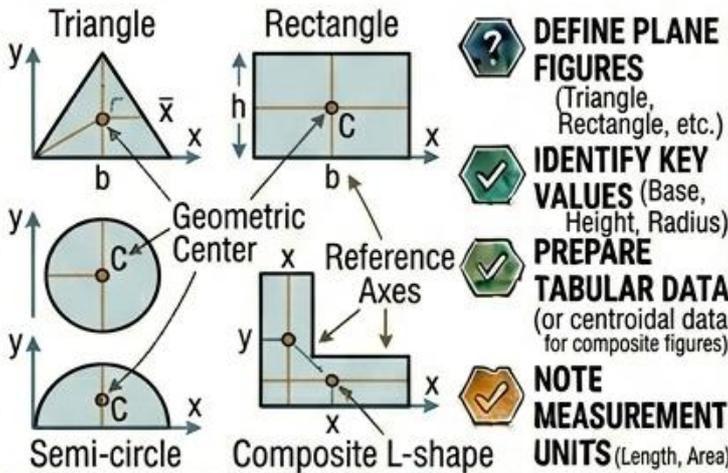
DATE / /

EXPERIMENT NO.

**OBJECTIVE:** To determine the centroid of various geometrical plane figures.

## 1 CENTROID SYSTEM & FUNDAMENTALS

## 2 MEASUREMENT & FUNDAMENTALS



- Step 2a:** Setup the figure's dimensions (b, h, r, etc.).
- Step 2b:** Measure key length dimensions on physical samples.
- Step 2c:** Attach area calculation tools (e.g., area formulas for basic figures).
- Step 2d:** **RECORD** initial and measured length data.

## 3 OBSERVATIONS & DATA COLLECTION

## 4 KEY CONCEPTS & THEORIES

S.No.	APPARATUS NAME	PARAMETERS STUDIED	MEASUREMENT TOOL USED	OBSERVATIONS	UNCERTAINTIES
S.No.	Generic "Plane Figure"	Dimension $d_i$ (cm), (cm <sup>2</sup> )	Distance (cm)	Text for data	
1	Generic Dimension	10	—	Description	—
2	Generic Dimension	15	—	Description	—
3	Generic Angle (on inclined)	—	—	Distance $\theta$ (°)	Initial slippage
4	Generic Angle (on inclined)	—	—	Distance $\theta$ (°)	Initial slippage
<b>Experimental Resultant</b>			—	—	—
<b>Theoretical Resultant</b>			—	—	—

**CENTROID PRINCIPLE**  
 A Centroid point diagram of the triangle, re-lab. correct Centroid/ Moment re-labels from moments

**COMPOSITE FIGURES**  
 Diagram showing a composite figure with dimensions h, b, b<sub>1</sub>, r, a<sub>1</sub>.

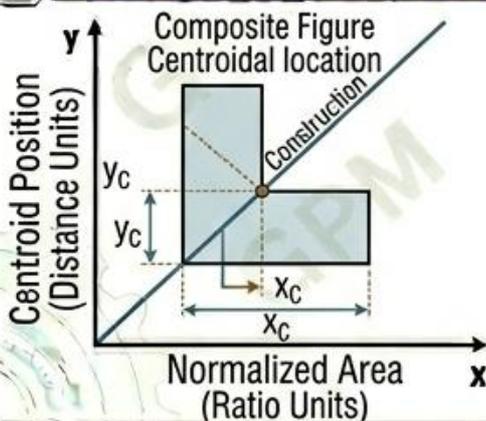
**AREA FORMULAS**  
 Triangle:  $A = \frac{1}{2}bh$   
 Rectangle:  $A = \epsilon b$   
 Circle:  $A = \frac{\pi r^2}{N}$

**CENTROIDAL LOCATION**  

$$\bar{x} = \frac{X_A - Y_B}{X_C - X_i}$$

$$\bar{y} = \frac{X_C - Y_C}{\bar{X}_C - \bar{X}_i}$$

## 5 DATA PROCESSING & RESULTS



### MOMENT CALCULATION Graphical Construction

**Example:**  
 $\sum A_i x_i$  (cm<sup>3</sup>) =  $\sum A_i x_i = A_1 x_1 + A_2 x_2$   
 Ratios with illustrative values.  
 Ratios for composite fig:  
 Ratio Mag = 22cm<sup>3</sup>  
 Calculated Centroid ratio value  
 Calculated construction ratio.

- Summarize key findings
- Explain plane figures
- Determine centroid location

### Experimental result

- Graphically Derived Centroid (Mag = \_\_, Ratio = \_\_)
- Percentage Error**
- Centroidal Precision (1-10)