

Experiment No:

Date:

Concave Mirror

Aim:

To find the Focal Length of the Concave Mirror and hence to find its Radius of Curvature.

Apparatus:

Concave Mirror, Screen, Illuminated wire Gauze, Stand, metre scale etc.

Principle:

1. **The distance object method:**

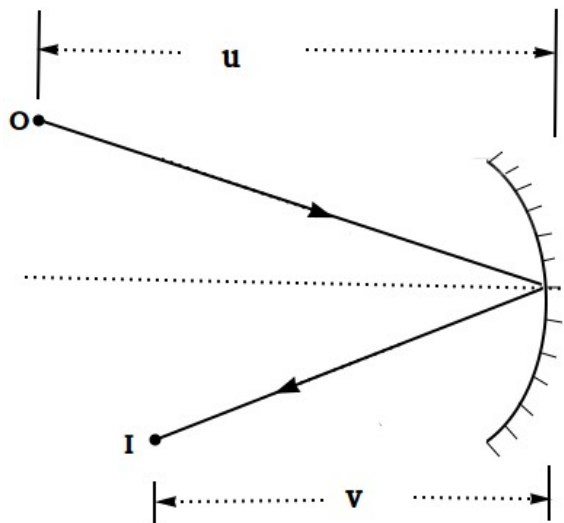
If the object is placed in **infinity**, the distance between the lens and the screen is the **focal length**

2. **u – v method:**

The focal length

$$f = \frac{uv}{u+v}$$

where **u** is the object distance and **v** is the image distance



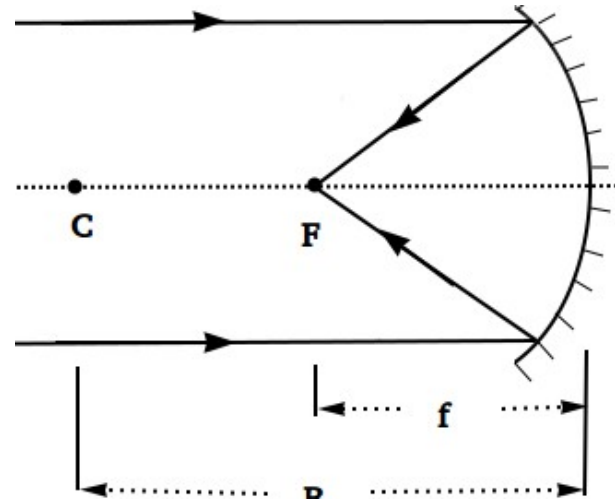
u – v method

4. **from u – v graph:**

The focal length

$$f = \frac{OA+OB}{4}$$

where **OA** and **OB** are the coordinates at the point where **u = v**

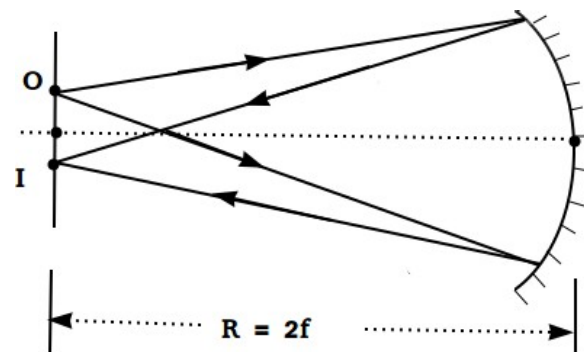


Distance Object Method

3. **Normal Reflection Method:**

In this method **u = v = R**

then $2f = R$ or $f = \frac{R}{2}$

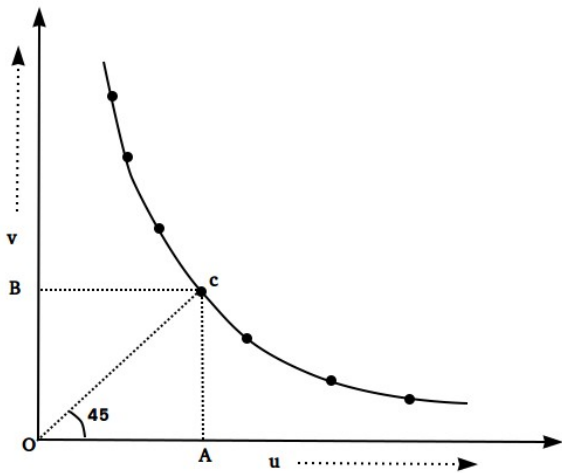


Normal Reflection Method

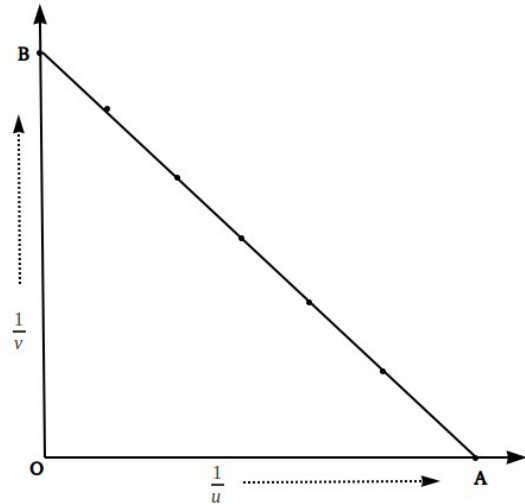
5. **From $\frac{1}{u} - \frac{1}{v}$ graph:** The focal length

$$f = \frac{2}{OA+OB}$$

where **OA** and **OB** are the **intercepts** at X – axis and Y – axis.



u-v graph



$\frac{1}{u} - \frac{1}{v}$ graph

Observations:

Distance Object Method:

f1 = cm	f2 = cm	f3 = cm	Mean f = cm = m
--------------------	--------------------	--------------------	-----------------------------------

Normal Reflection Method:

R1 = cm	R2 = cm	R3 = cm	Mean R = cm = m
			Focal Length f = R/2 = cm = m

u - v method

Trial No	Object Distance (u) cm	Image Distance (v) cm	$\frac{1}{u}$	$\frac{1}{v}$	$f = \frac{uv}{u+v}$	Mean f
1						
2						
3						
4						
5						
6						

Calculations:

From u - v graph: $f = \frac{OA+OB}{4} =$ = cm = m

From $\frac{1}{u} - \frac{1}{v}$ graph: $f = \frac{2}{OA+OB} =$ = cm = m

Results:

- Focal length of the given Concave Mirror from u-v method = m
- Focal length of the given Concave Mirror from u-v graph = m
- Focal length of the given Concave Mirror from $\frac{1}{u} - \frac{1}{v}$ graph = m
- Focal length of the given Concave Mirror from distant object method = m
- Radius of Curvature of the Concave Mirror = m