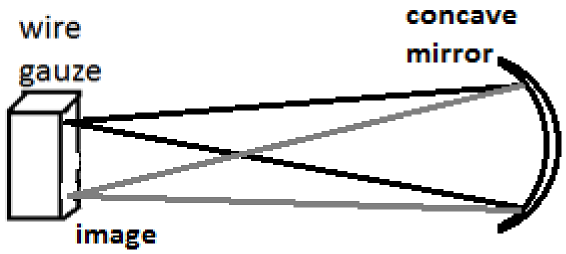
Observations and Calculation

Normal incidence method



Trial No.	Distance between Mirror and gauze when image form near gauze u = v = R in cm	Mean R in cm
1		
2		

focal length of a concave mirror **f =** $\frac{R}{2}$ = ... cm

= .... m

u - v method – suitable u values

Using Normal incidence method we can find focal length, based on that chose suitable values for u between 1.5*f and 2.5*f example if **f** =20 cm then 1.5x20 = 30cm and 2.5x20 = 50 cm then u can be 36,38,40,42,44,46

CONCAVE MIRROR

AIM

To find the focal length of a concave mirror by

a) Normal incidence method

b) **u** - **v** method

c) from **u** - **v** graph

APPARATUS

Concave mirror, illuminated wire gauge, meter scale, mirror stand, white screen.

THEORY

In a concave mirror reflection takes place from inner curved surface. The distance between pole and the principle focus of the mirror is called focal length.

Normal incidence method:

The mirror is mounted in front of the wire gauze and adjusted till a clear image is formed by the side of the wire gauze itself. The distance between mirror and image is radius of curvature.

focal length of a concave mirror, **f =** $\frac{R}{2}$

u - v method

Focal length of the convex mirror is given by

$$\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$$

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

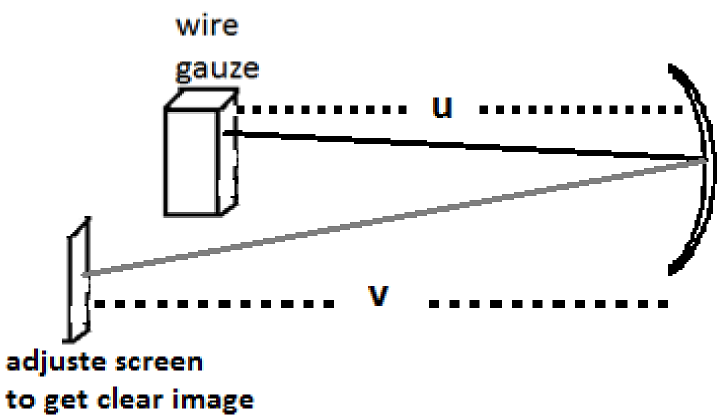
Where **u** = object distance

(distance between wire gauge and mirror)

v = image distance

(distance between wire image and mirror)

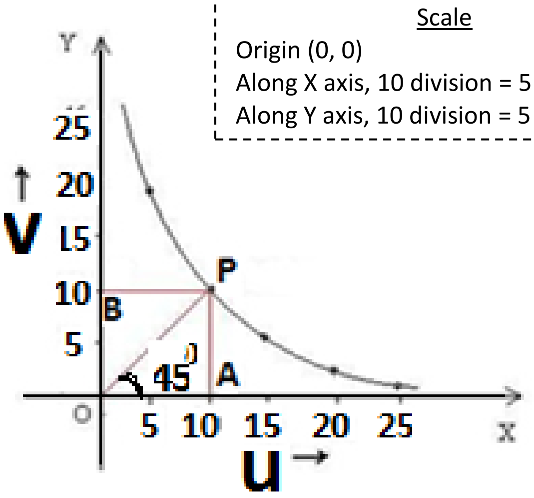
u - **v** method



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

u - **v** graph

mean f = ………………. m



Scale
Origin (0, 0)
Along X axis, 10 division = 5 cm
Along Y axis, 10 division = 5 cm

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

= ………………. cm

= ………………. m

From u - v graph:

While drawing **u** - **v** graph same scale and same origin chosen from both the axes. The focal length can be found out by using the equation

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

PROCEDURE

Normal incidence method: The mirror is mounted in front of the wire gauze and adjusted till a clear image is formed by the side of the wire gauze itself. The distance between mirror and image is radius of curvature. The experiment is repeated and the mean value is calculated.

u-v method: the mirror is placed at a suitable distance u from illuminated wire gauze and adjust the screen until a clear image is formed on the screen placed near the side of wire gauze. The distance between mirror and screen is measured. The experiment is repeated for different values of u and in each case v is measured. Focal length is calculated in each case and mean value is determined.

u-v graph : A graph is plotted with u along x - axis and v along y-axis as shown in figure. A bisector to XOY is drawn (at 45°)which meats the graph at P. the distance OA and OB is found and focal length is calculated by using the equation

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

RESULT

Focal length of the given concave lens

a) Normal incidence method, **f** =…………………m

b) **u** - **v** method, **f** =…………………m

c) from **u** - **v** graph, **f** =…………………m