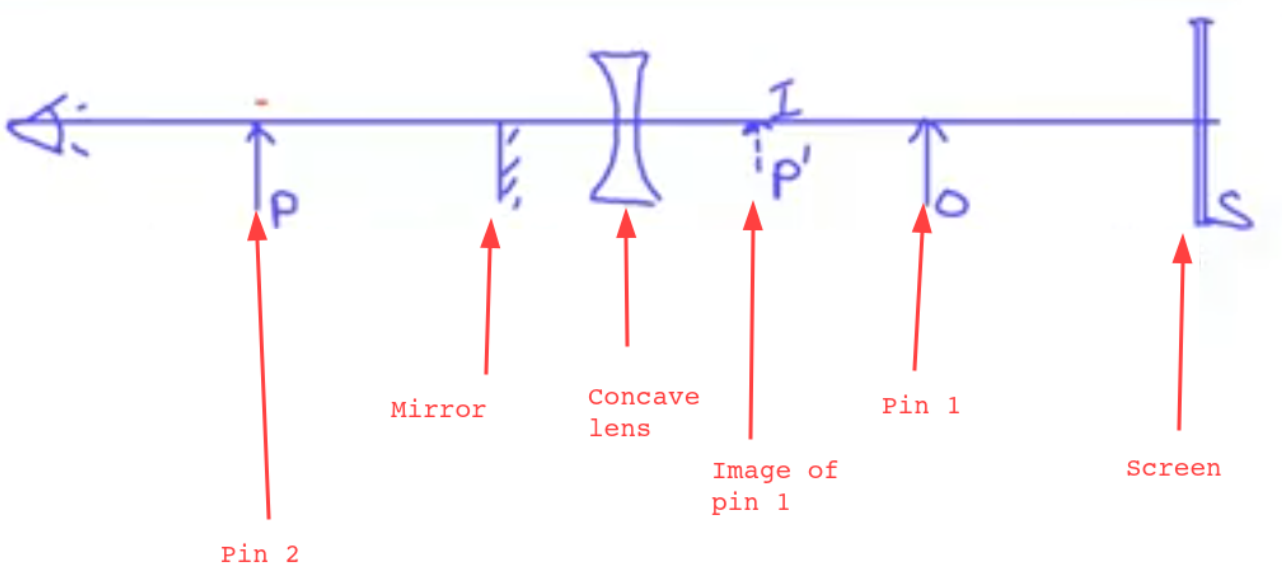
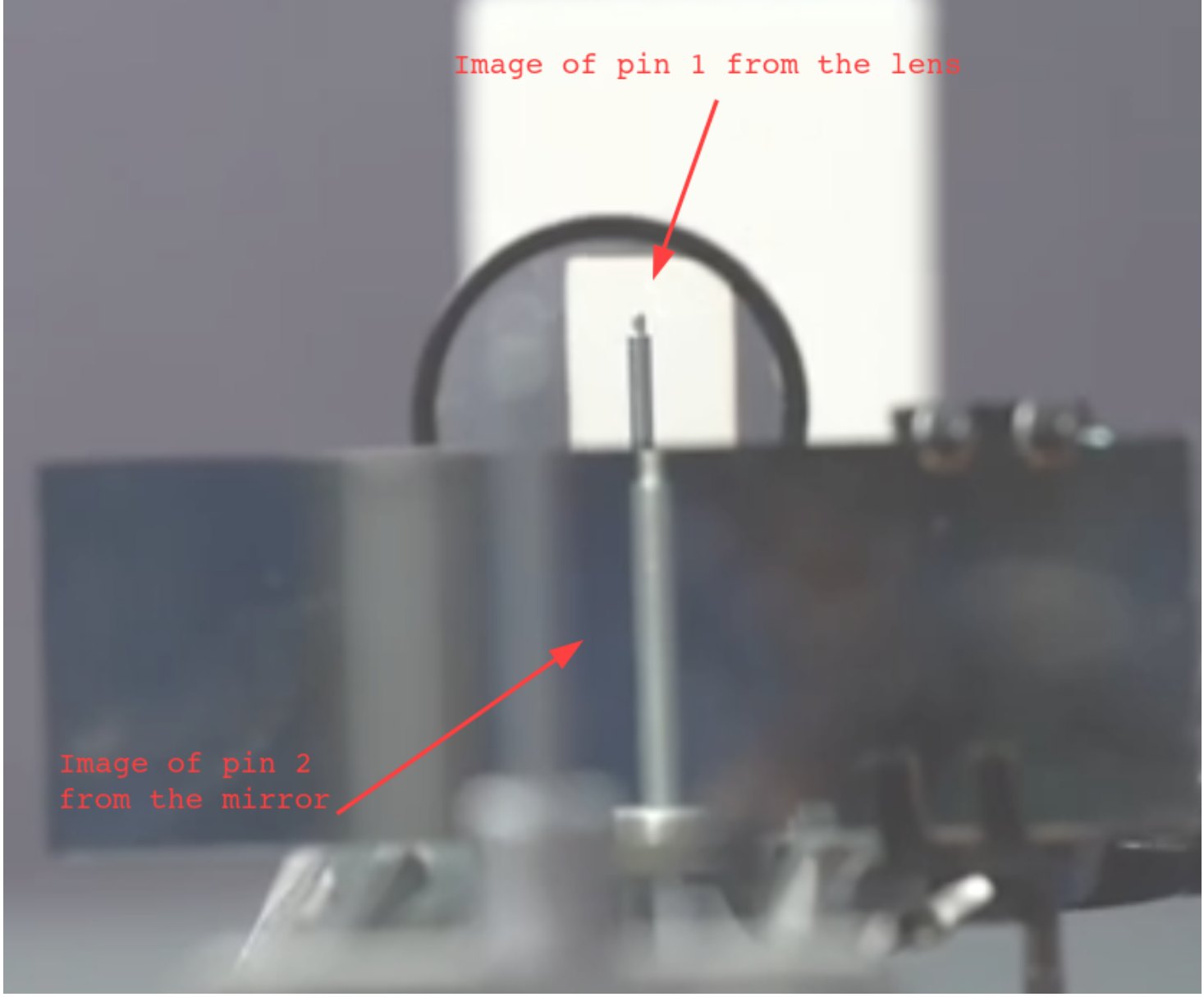
- Initial setup



First we keep the pin 1 at the right side of the concave lens. The image of that pin will be in between of the pin and the lens (concave lens images properties). To find out the exact position of that image we need to coincide another image with that.

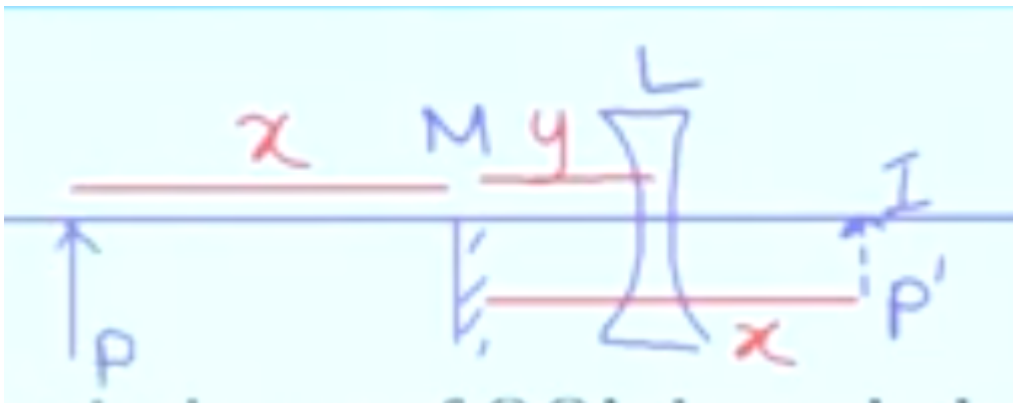
For that we keep another pin of the other (left) side and keep a mirror in between the pin 2 and the lens such that **half of the lens is covered**. Now we when we look from the left side, we can see both the images of pin 1 and pin 2.



By changing the distance from lens to pin 2 we need to coincide the image of pin 2 with the image of pin 1.

> After its in this position, when the eyes are moved laterally, there will be no relative motion

When that happens we use the properties of place mirror images, we can find the image distance of pin 1



> Accordingly the image distance `v` will be `x-y`

$$v = x - y$$

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

$$\frac{1}{x-y} = \frac{1}{u} + \frac{1}{f}$$

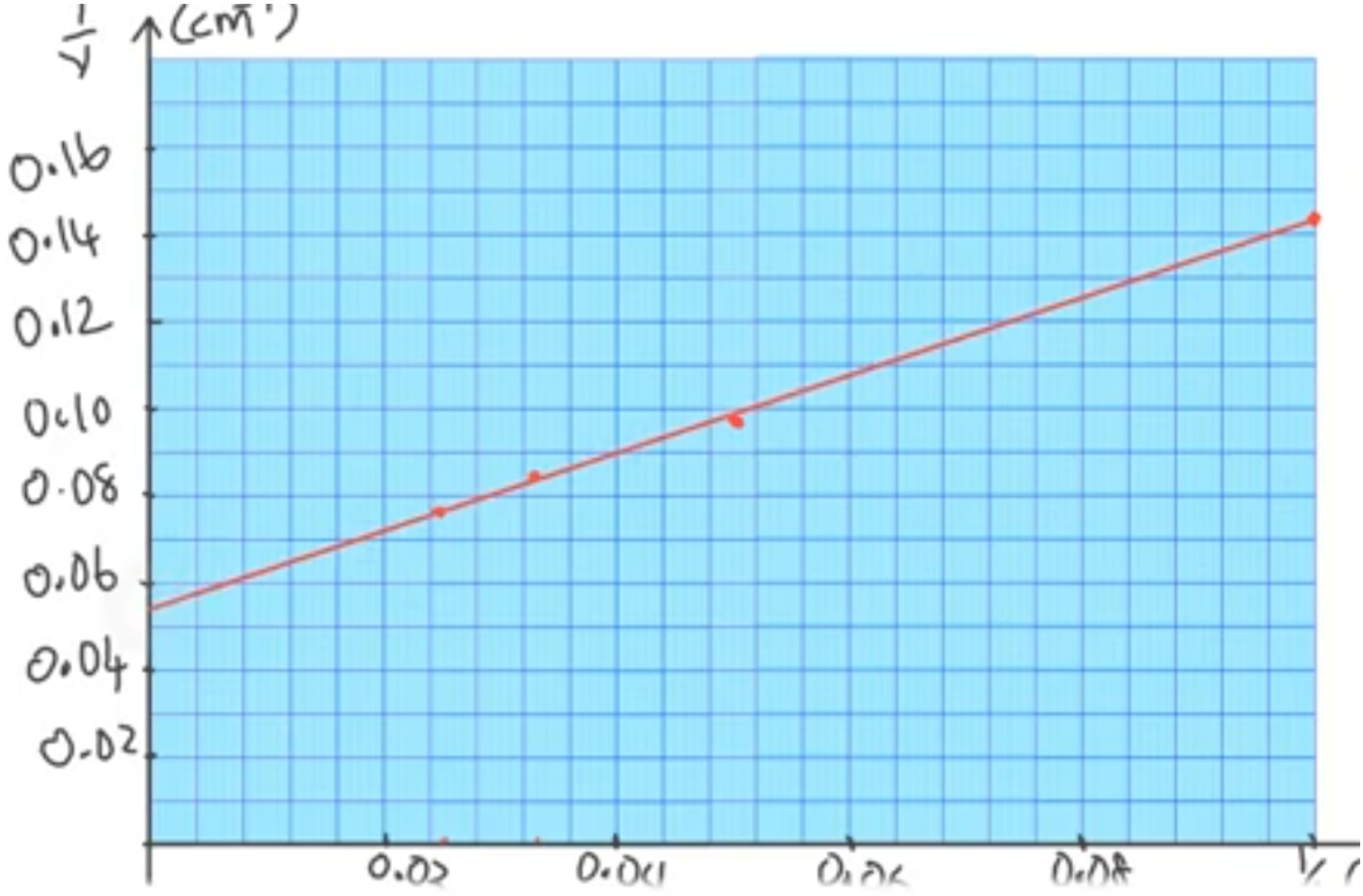
$$y = mx + c$$

$$intercept = \frac{1}{f} = c$$

$$\therefore f = \frac{1}{c}$$

Rest of the points and the arrangements are same as the convex lens practical 21A - Finding the focal distance of convex lens

In here as well we need to get multiple readings and draw a graph

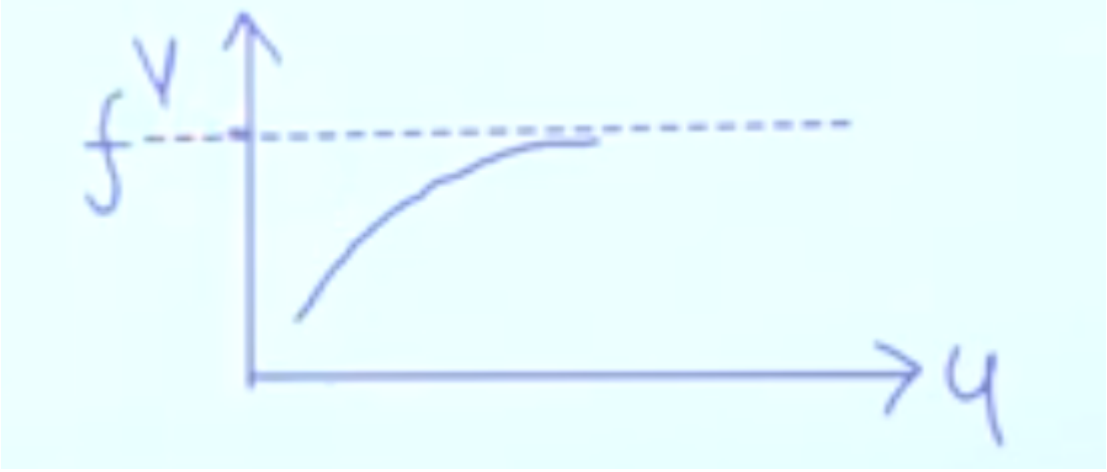


Important points

- What type of image will be formed here?

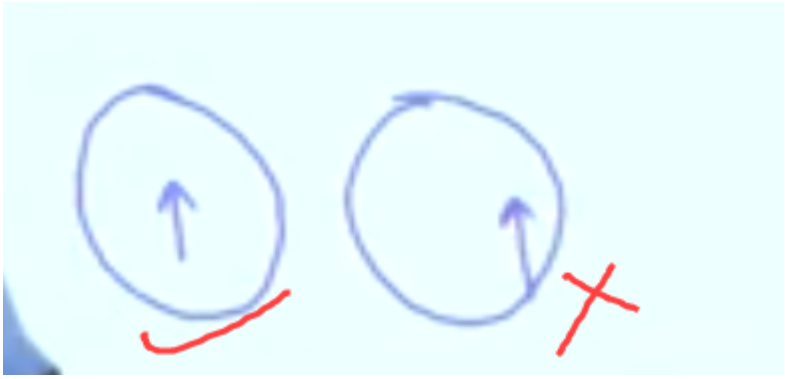
```
An upright, diminished image
```

- How does `v` change with `u` in a concave lens?



> when `u` goes to infinity, `v` equals to `f`

- What would be the errors that we have made if we see an image which is not at the center of the lens? (right one in the diagram)



```
The lens, pin and your eye might not be in the same straigh line

Or the lens could be not perpendicular to the straight line of the eye and object path.
```

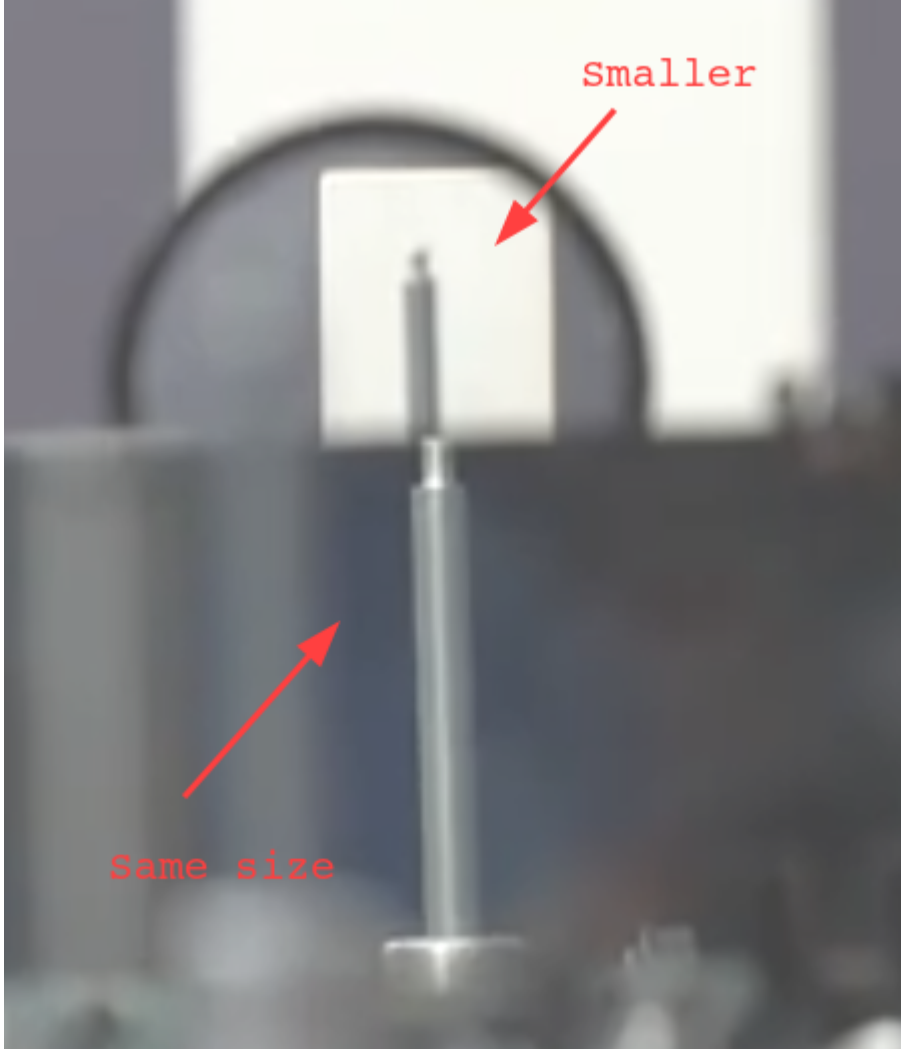
- why should we only cover the half of the lens with the mirror?

```
So that we can see the image of the pin 1 from the other half of the lens.
```

> This can be either the top or bottom half. But respective to the half you cover the pin 2 should be placed. If you cover the top half. the pin 2 should be set at the top, if you cover the bottom half the pin 2 should be at the bottom.

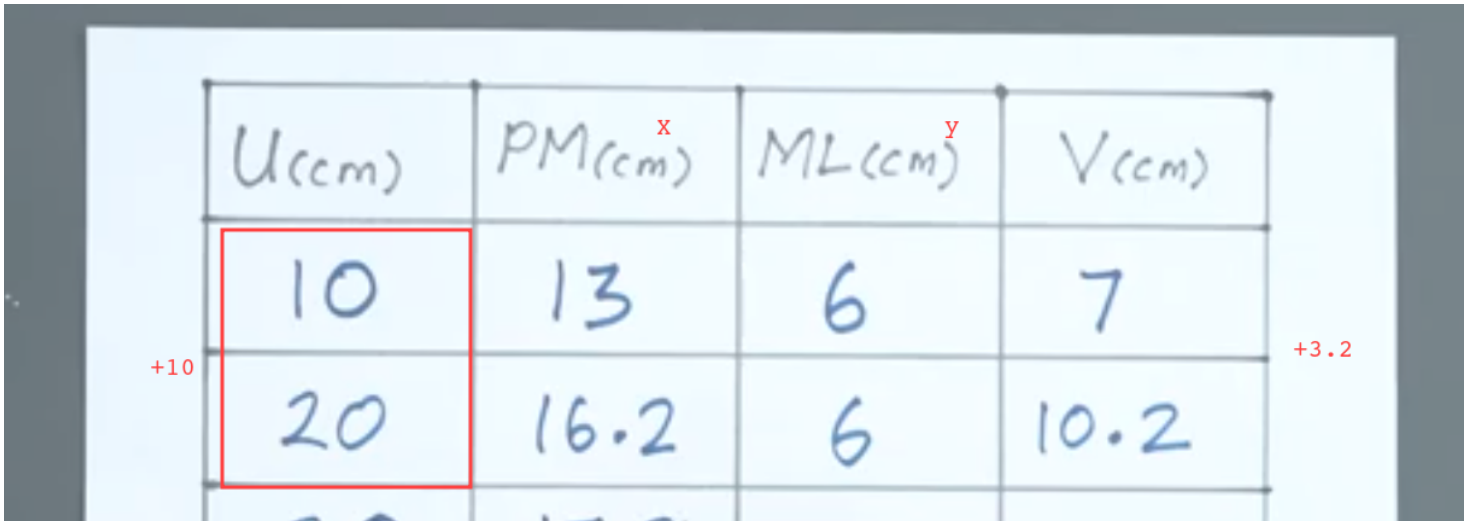
- what are the differences between the 2 images formed by 2 pins.

```
image 1 - as it is observed through a concave lens, the size is diminished
image 2 - as its observed through a mirror. the size is same as the object.
```



- Why do we need to change the object distance of the pin in this experiment by a bigger amount compared to the convex lens experiment?

When getting multiple readings, when we change the object distance by a small amount, the image distance will be changed only be a very small amount. So to avound fractional error it the image distance reading, we increase the object distanc by a large amount like 10cm



> Here we see when we made a change of 10cm to the image distance, only a 3.2cm change has happened to the image distance