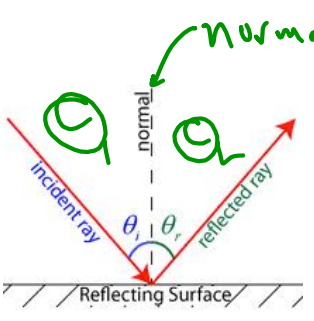
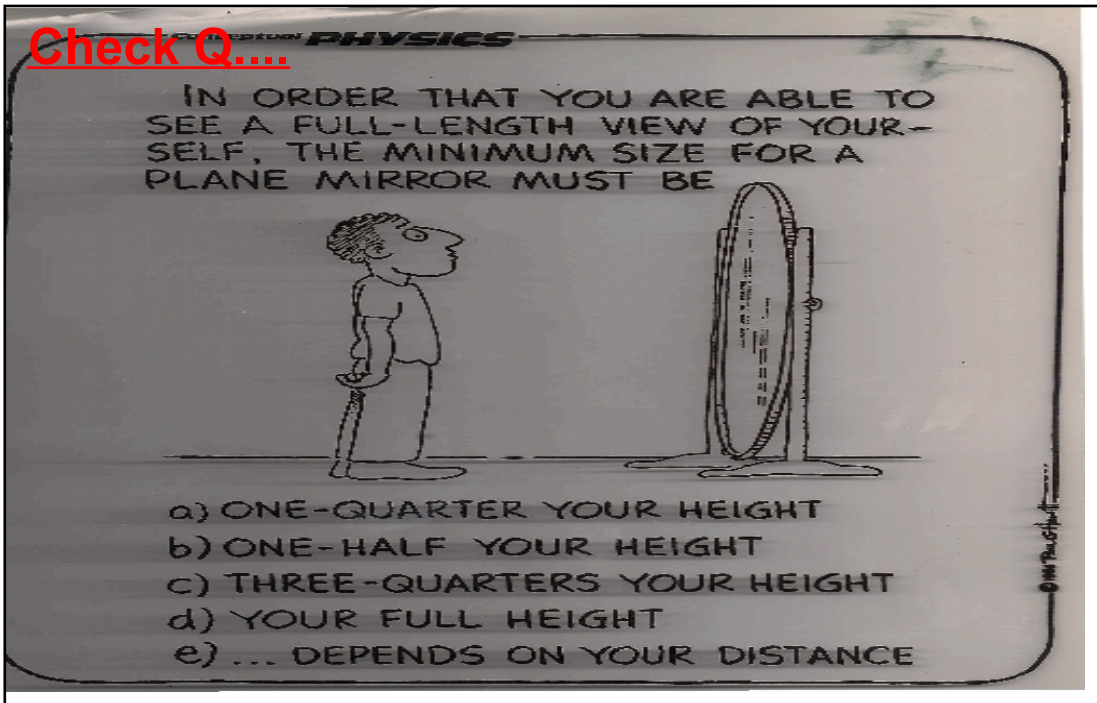
Chapter 25 notes - ~~Lenses and~~ Mirrors

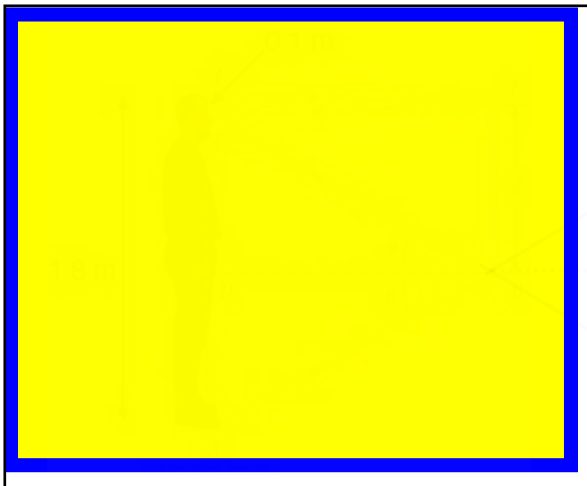
Law of Reflection

The angle of incidence equals the angle of reflection



Check Q....





For plane mirrors image is ALWAYS erect and SAME distance behind mirror as object is in front of mirror

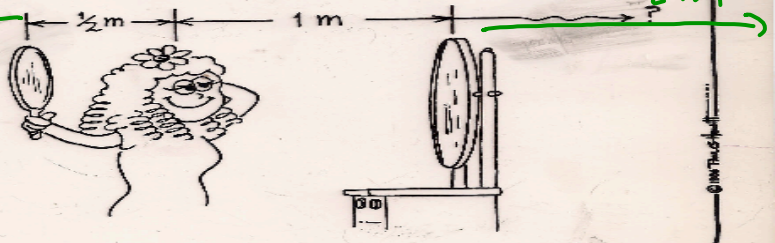
Check Q....

SHE STANDS 1 METER IN FRONT OF THE DRESSER MIRROR AND LOOKS AT THE FLOWER ON THE TOP OF HER HEAD IN A SMALL MIRROR HELD ½ METER BEHIND HER HEAD.

HOW FAR IN BACK OF THE DRESSER MIRROR DOES SHE SEE THE IMAGE OF THE FLOWER ?

1/2m

2 m



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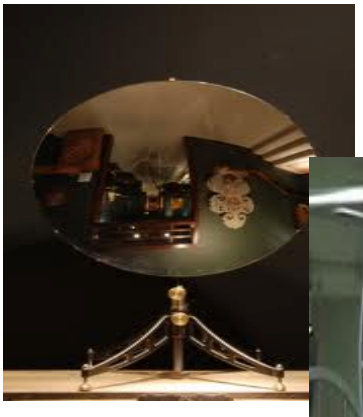
Demos - mirrors



Rules for Ray Diagrams for mirrors

we choose 3 rays from many because when they cross we know where the image forms*

distance to center = R, focal length = R/2

1) Any ray going ***parallel*** to the optical axis will reflect through the ***focus***

2) Any ray passing through the ***focus*** will reflect ***parallel*** to the optical axis

3) Any ray passing through the ***center*** of curvature will reflect back upon itself ***without bending***

Equations for Ray Diagrams

$$1/d_o + 1/d_i = 1/f$$

$$m = -d_i/d_o = h_i/h_o$$

*** all measurements are relative to optical axis***

d_o = distance to object

d_i = distance to image

f = focal length = R/2

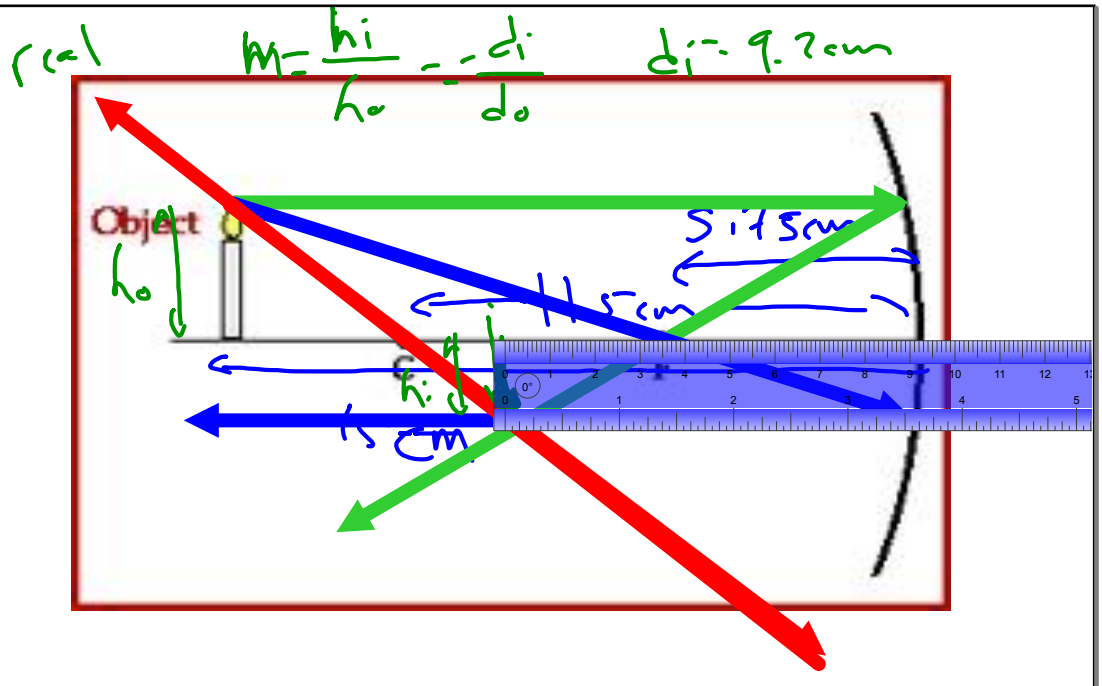
h_i = height of image

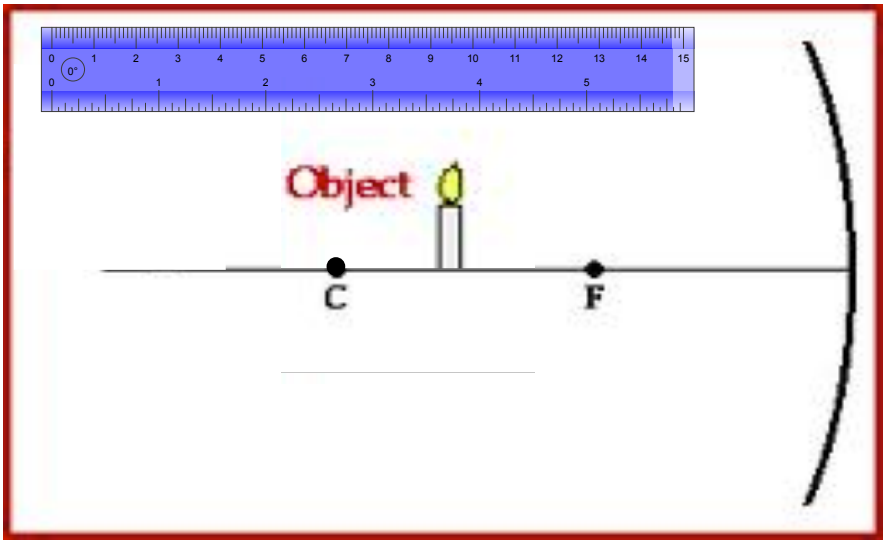
h_o = height of object

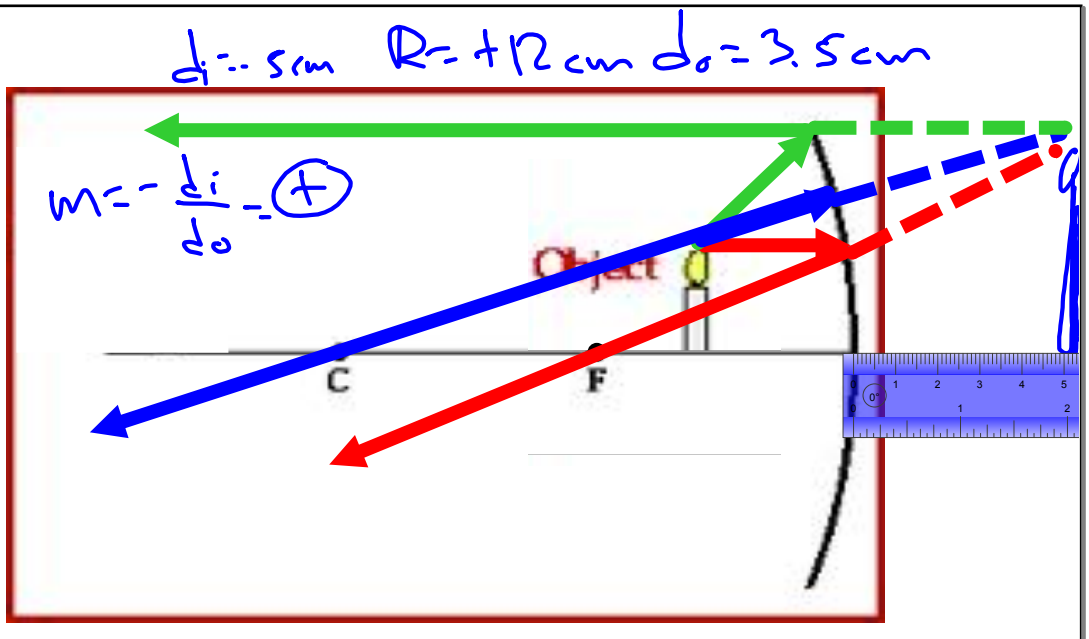
m = magnification

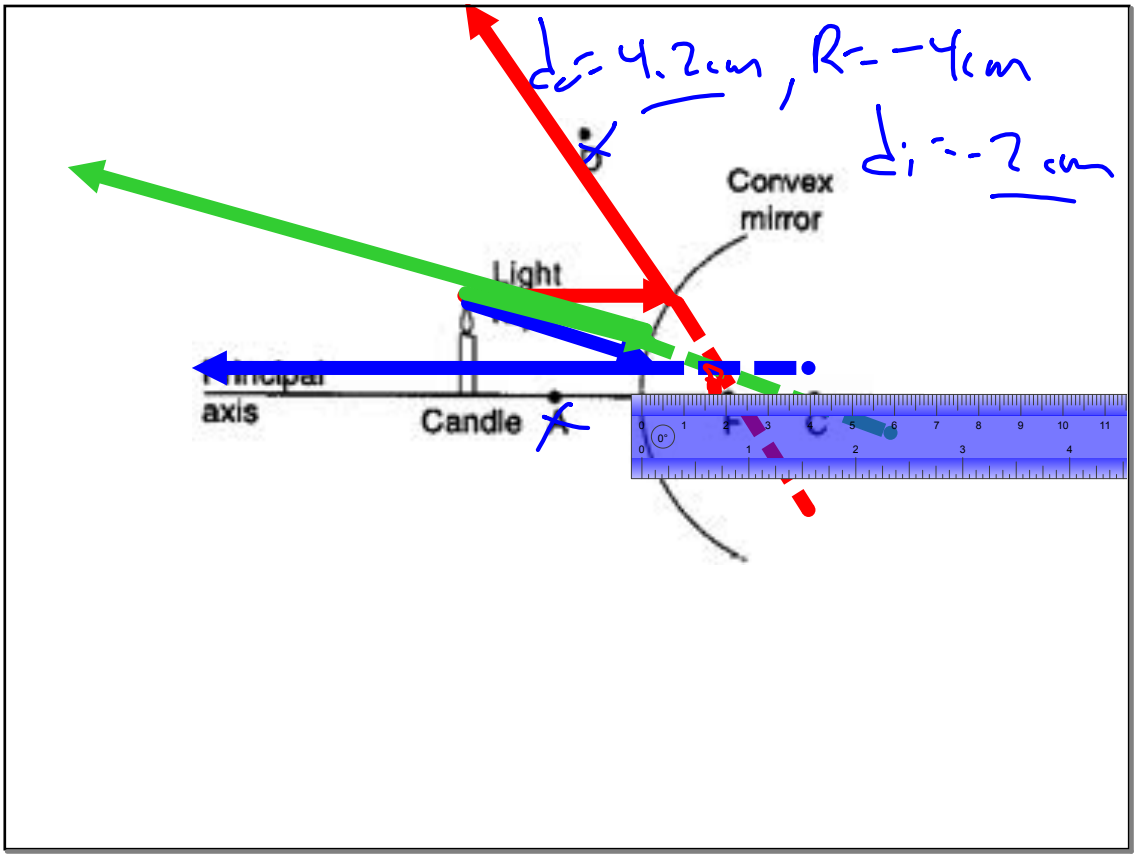
Sign conventions

where?	+	-
f	concave mirror/ converging device	convex mirror/ diverging device
d_o	ALWAYS	NEVER
d_i	Real image/ light crosses/ "Right" side of mirror	virtual image/ light does NOT cross/ "wrong" side of mirror
m	upright/virtual	inverted/real



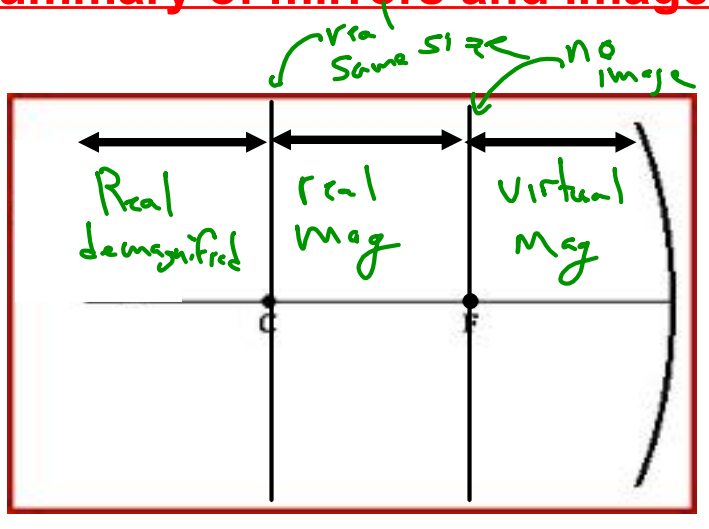

Object
C
F


d_i = .5cm R = +12cm d_o = 3.5cm
$m = -\frac{d_i}{d_o} = +$
Object
C
F



Summary of mirrors and images

Phet Optics



Convex = ALWAYS virtual and demagnified...disappears at focal point as object is moved further from lens