

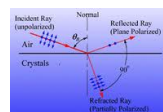
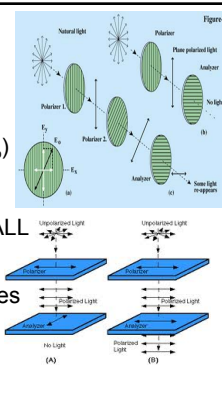
Chapter 24/25 Review Notes

**EM Radiation**

- know from low f --> high f
  - > radio, micro, IR, vis, UV, x-ray, gamma
- created by MOVING CHARGED particles
- transverse (no medium needed)
- fastest in vacuum, slowest in solids
- $c = 3 \times 10^8$  m/s

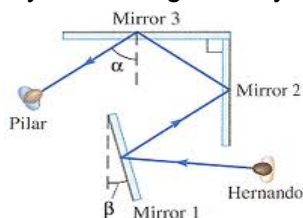
**Polarization**

- vibrates in ONE plane
- reflection = polarized // surface
- non-polarized  $\rightarrow$  polarizer ( $S = 1/2S_0$ )
- polarized  $\rightarrow$  polarizer ( $S = S_0 \cos^2\theta$ )
  - > two polarizers SAME direction = ALL goes through
  - > two polarizers at  $90^\circ$  = NONE goes through



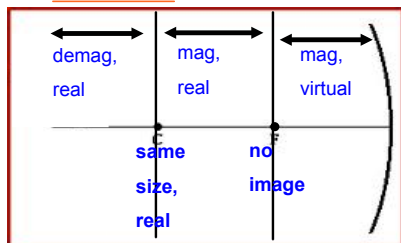
**Mirrors**

- $\theta_i = \theta_r$
- know your basic geometry



plane	concave/ converging	convex/ diverging
always virtual	real or virtual	always virtual
$m = 1$	$m$ varies	$ m  < 1$
	$d_o > 2f,  m  < 1$ , real	
	$d_o = 2f,  m  = 1$ , real	
	$2f < d_o < f,  m  > 1$ , real	
	$d_o = f$ , no in	
	$d_o < f,  m  > 1$ , virtual	

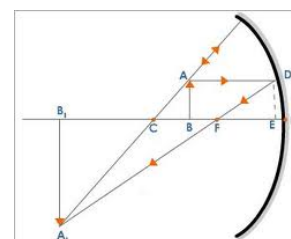
**Concave**



convex = always demagnified and virtual

Lens Equations:

$C = R = 2f$   
 $1/d_o + 1/d_i = 1/f$   
 $m = -d_i/d_o = h_i/h_o$



**+ and - conventions**

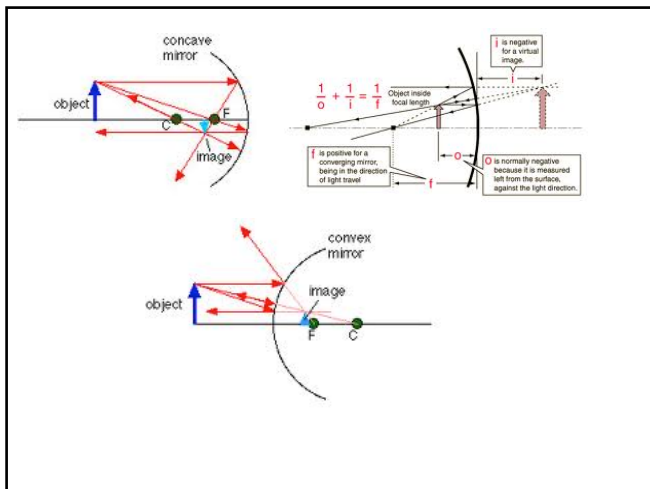
	+	-
$d_o$	always	
$d_i$	real	virtual
$f$	concave	convex
$m$	virtual	real
$h_i$ and $h_o$	always	

**real image** = REAL light, lines cross, inverted, only by concave, CAN focus on screen

**virtual image** = NOT real light, lines do NOT cross, erect, all mirrors, CANNOT focus on screen

**Ray Diagram Rules**

1. parallel --> focus
2. focus --> parallel
3. Center --> straight



**Other EQ's to know:**

$$v = \lambda f$$

$$f = 1/T$$

$$E = cB$$

$$u = 1/2\epsilon_0 E^2 + B^2/2\mu_0$$

$$S = cu$$