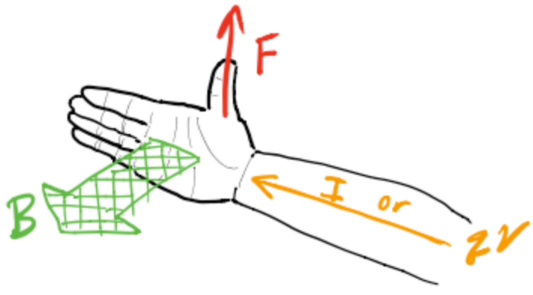
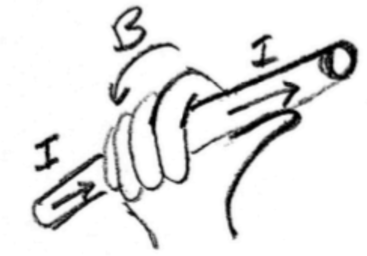
$$\vec{F}_B = q\vec{v} \times \vec{B}$$

$$\vec{F}_B = I\vec{L} \times \vec{B}$$



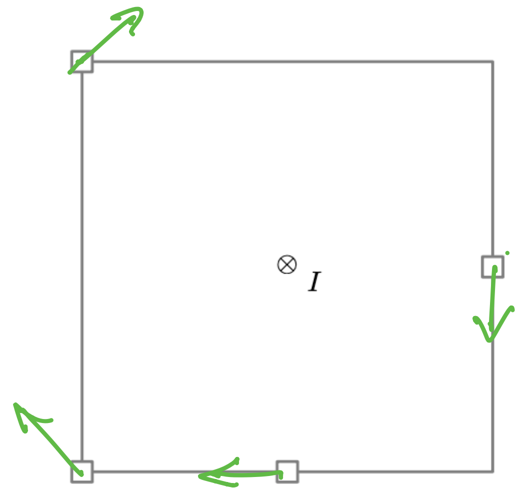


$$B = \alpha I$$

$$\mathcal{E} = -\frac{d}{dt}\vec{B} \cdot \vec{A}$$

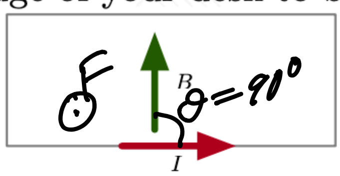
induced current opposes change

1 A wire carrying a current I pierces a piece of papers so that the current is normal to the surface of the paper as shown. The current produces a magnetic field. There are four small squares draws around the edge of the paper. Indicating the direction of the magnetic field at each small square.



2 A wire that is 0.5 meters long is running along the front edge of your desk. A current of 8 amps is going to the right in the wire. A horizontal magnetic field of 0.8 Tesla is filling your room. The field is directed from the front edge of your desk to back edge.

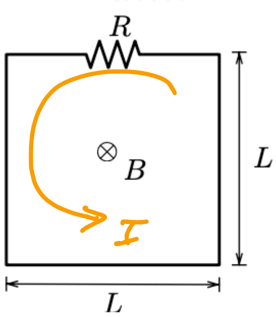
$F = ILB \sin\theta$
$= 3.2N$



F is up

(a) What is the direction of the force on the wire caused by the magnetic field?
(b) What is the magintude of the force on the wire?

3 A square loop of wire with a resistor is formed. A magnet field is normal to the loop as indicated. The field strength increases from 7 to 11 tesla in 2 seconds.
(a) What is the magntiude of the current in the resistor while the field is changing?
(b) Is the current in the resistor going right or left?
$L = 0.2\text{m}$ and $R = 2\Omega$



$$\mathcal{E} = -\frac{d}{dt}\vec{B}\cdot\vec{A} = -\frac{d}{dt}BA$$

$$|\mathcal{E}| = \frac{B_f - B_i}{\Delta t} L^2$$

$$= \frac{11-7}{2}(0.2)^2 = 0.08\,V$$

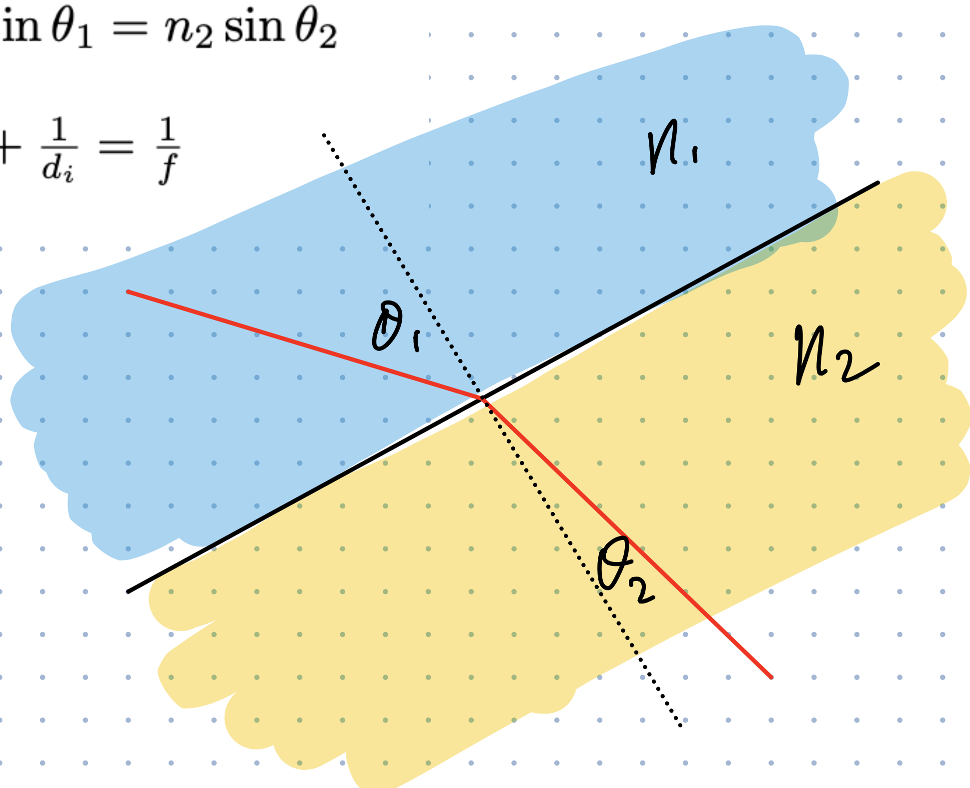
$$I = \frac{V}{R} = \frac{0.08V}{2\Omega} = 0.04\,A$$

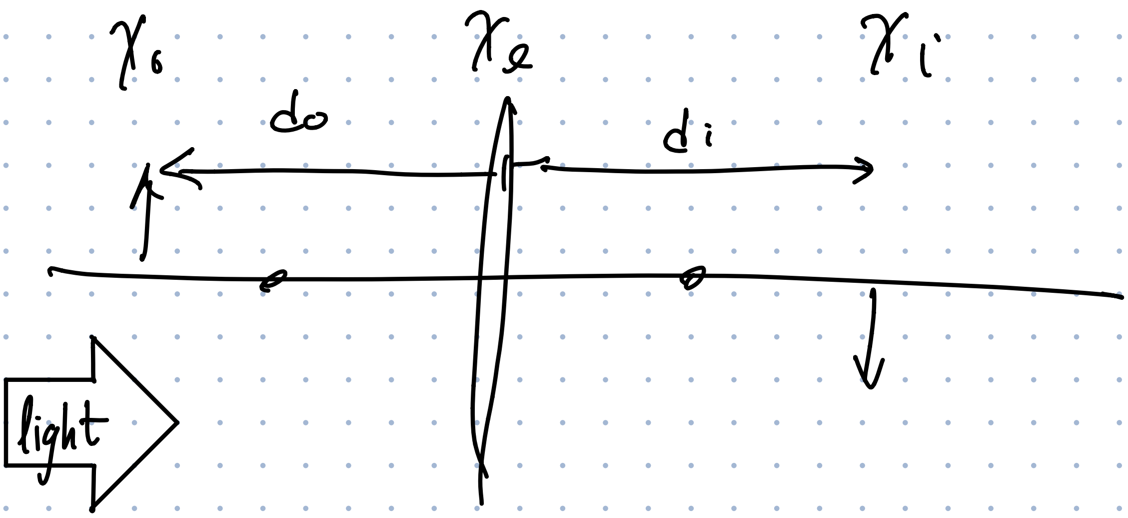
Make up quiz for Wednesday

$$n = \frac{c}{v} \longrightarrow \lambda = \frac{\lambda_0}{n}$$

$$n_1 \sin\theta_1 = n_2 \sin\theta_2$$

$$\frac{1}{d_o} + \frac{1}{d_i} = \frac{1}{f}$$

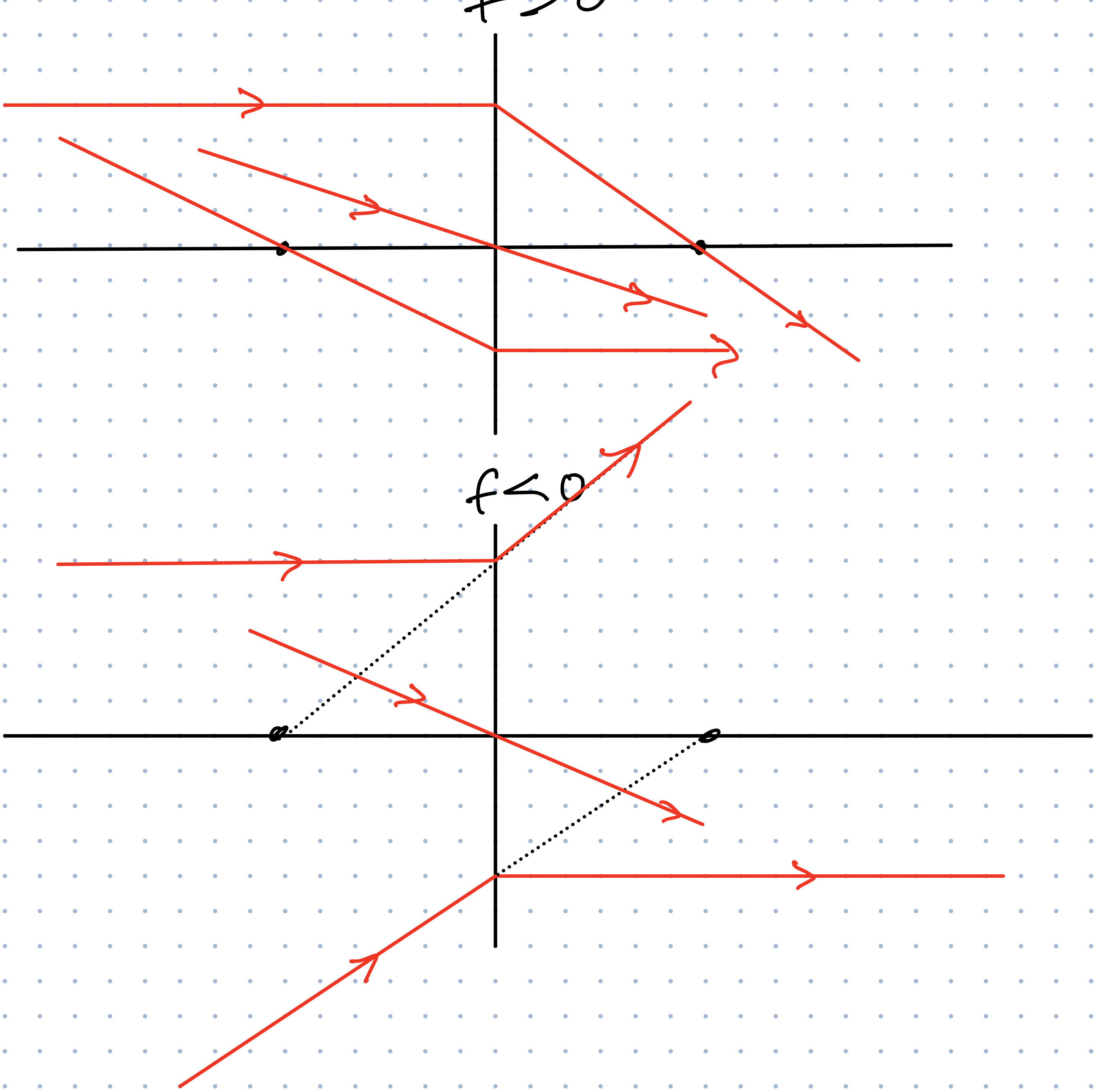




$$d_o = x_\ell - x_o = -(x_o - x_\ell)$$

$$d_i = x_i - x_\ell$$

$f > 0$


f<0