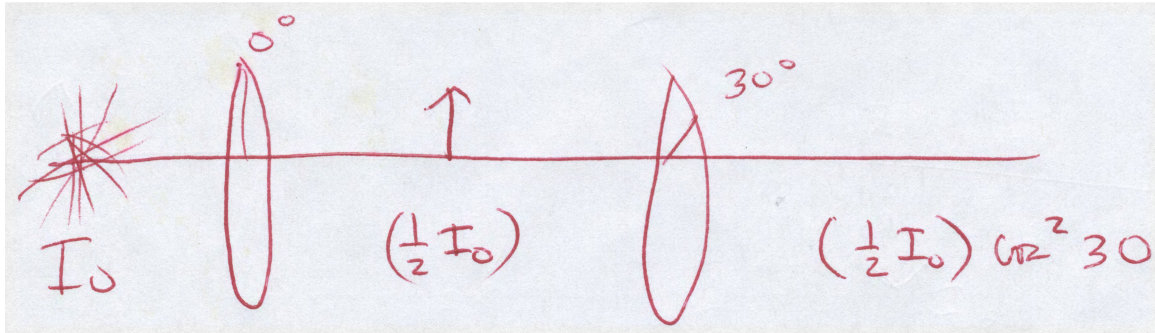


5. (20 pts.) Unpolarized light of intensity  $I_0$  is incident upon a polarizing filter oriented at  $0^\circ$ . The emerging light strikes a second polarizing filter whose axis is at an angle of  $30^\circ$  relative to the first. What is the ratio of the intensity of the beam after it has passed through the second polarizer to the original intensity?

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$$\text{Ratio} = \frac{\frac{1}{2} I_0 \cos^2 30}{I_0} = \frac{1}{2} \left( \frac{\sqrt{3}}{2} \right)^2 = \frac{3}{8} = 0.375$$