Warm Up Question 1

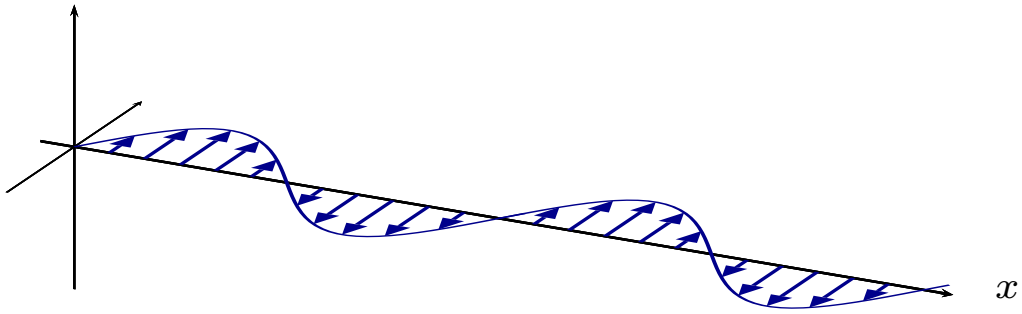
A tiny LED (light emitting diode) light source emits electromagnetic waves with a constant power. The intensity of the light is observed at two points: point A is $1\,\mathrm{m}$ from the source and point B is $5\,\mathrm{m}$ from the source. Describe as precisely as possible how the intensity of the light at A is related to the intensity at B. Explain your answer.

1. More at A.
2. Intensity at B is $1/5$ of intensity at A.
3. Intensity at A is 25 of intensity at B. Power goes as $1/r^2$.

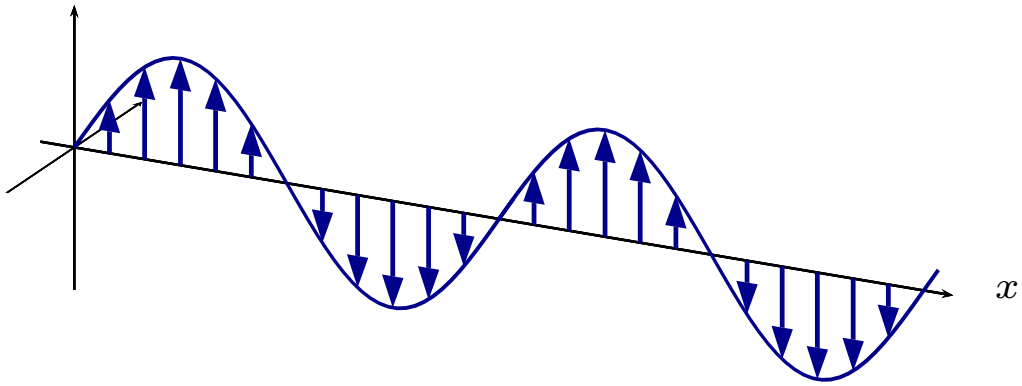
Linearly Polarized Electromagnetic Waves

Electromagnetic wave propagating along $+x$ direction. Only the electric field is indicated.

Horizontally Polarized

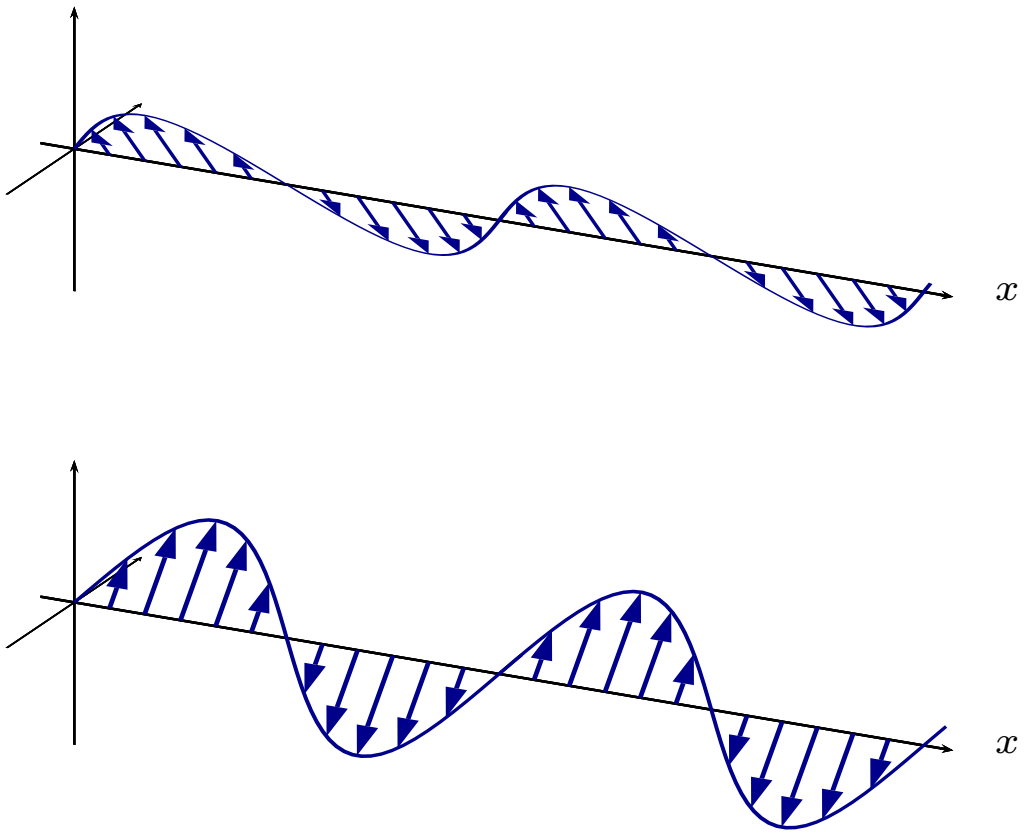


Vertically Polarized



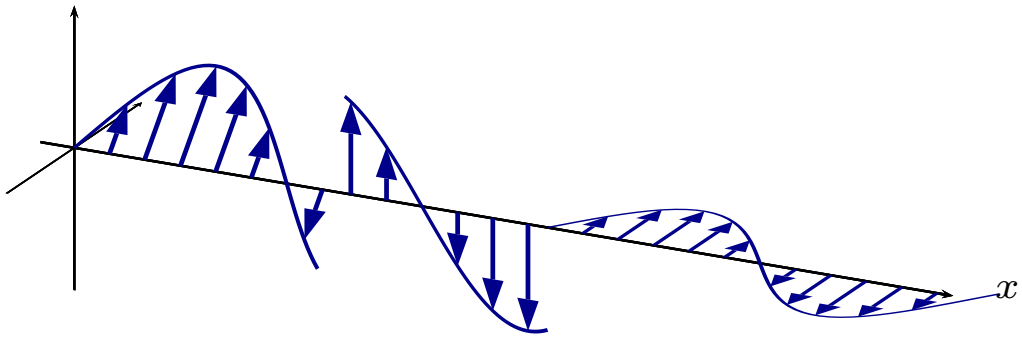
More Linearly Polarized Electromagnetic Waves

Electromagnetic wave propagating along $+x$ direction. Only the electric field is indicated.



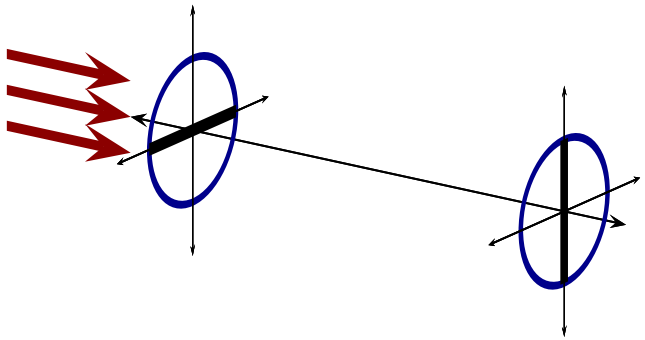
Unpolarized Electromagnetic Waves

Electromagnetic wave propagating along $+x$ direction. Only the electric field is indicated.



Question 1

Unpolarized light, whose intensity is I_{incident}, is incident upon a linear polarizer, whose axis of transmission is oriented horizontally. A second polarizer has transmission axis oriented vertically.

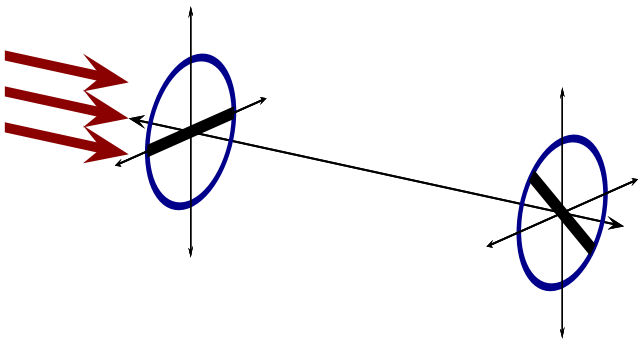


Which of the following represents the intensity of the light transmitted by the final polarizer?

1. 0
2. $\frac{1}{4} I_{\text{incident}}$
3. $\frac{1}{2} I_{\text{incident}}$
4. $\frac{1}{\sqrt{2}} I_{\text{incident}}$

Question 2

Unpolarized light, whose intensity is I_{incident}, is incident upon a linear polarizer, whose axis of transmission is oriented horizontally. A second polarizer has transmission axis oriented midway between vertical and horizontal.



Which of the following represents the intensity of the light transmitted by the final polarizer?

1. 0
2. $\frac{1}{4} I_{\text{incident}}$
3. $\frac{1}{2} I_{\text{incident}}$
4. $\frac{1}{\sqrt{2}} I_{\text{incident}}$

Warm Up Question 2

A pair of sunglasses is designed so that the polarization axis is vertical when worn by someone who stands upright. The person lies down on a bench on his side with one side of his head against the bench (i.e. one ear against the bench). Will these sunglasses eliminate the glare from a horizontal reflecting surface? Explain your answer.

1. No. The polarization axis is now horizontal and lets the horizontally polarized light pass.
2. Yes. The polarization axis is now horizontal and blocks the horizontally polarized light.