A beam of polarized photons is incident on a polarizer whose orientation is chosen so that the photons are either absorbed (with probability 1/3) or transmitted (with probability 2/3). What is the intensity of the transmitted light as a fraction of the intensity of the incident light?

A) 1/3

B) 1/9

C) 2/3

D) 4/9

E) I don't understand what probability means.

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$\frac{2}{3}$ of photons pass through

$\therefore$ $\frac{2}{3}$ intensity since

intensity $\propto$ # photons/sec.

Four photons with a vertical polarization are sent into a polarizer oriented at 45 degrees to the vertical. Which of the following is correct?

A) The photons will all be absorbed.

B) Two of the photons will pass through.

C) The photons will all be transmitted.

D) None of the above

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this is the most likely, but all of these outcomes are possible, with some probability

→ same as flipping coin 4 times - could get 4 heads.

A photon in a polarization state $|30°\rangle$ is sent towards a polarizer oriented at an angle 60°. What is the probability that it will be absorbed?

A) 0

B) 1/4

C) 1/2

D) 3/4

E) $\sqrt{3}/2$

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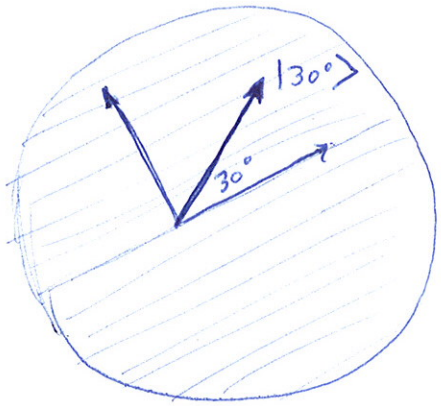

$P_{abs} = \sin^2(30°)$

$= \frac{1}{4}$