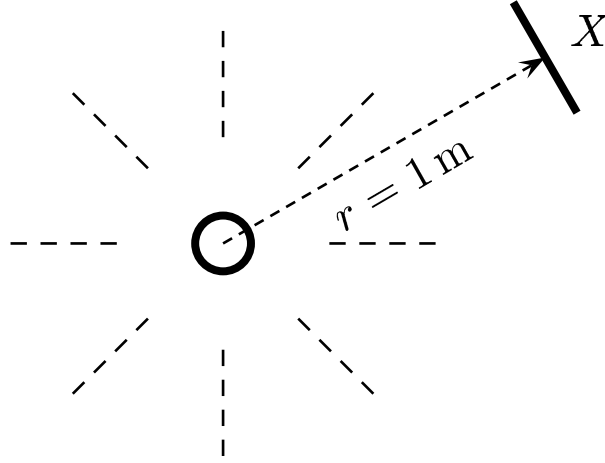


Given a light bulb with a power 120 W. A book is placed at point X , which is at a distance $r = 1$ m away. The book is perpendicular to the incident light. Its area is about 0.1 m^2 . For a black surface, the pressure given by light is $\frac{I}{c}$; for a totally reflecting surface, the pressure is $P = \frac{2I}{c}$, where I is the intensity of light at X .



If $\frac{1}{4}$ of the light is reflected, find the pressure P on the book.

A) $P = \frac{1}{2} \frac{I}{c}$

B) $P = \frac{3}{4} \frac{I}{c}$

C) $P = \frac{5}{4} \frac{I}{c}$

For the $\frac{1}{4}$ of the light which is reflected, it contributes $\frac{1}{4} \times \frac{2I}{c}$ to the

pressure.

For the $\frac{3}{4}$, which is absorbed, it contributes $\frac{3}{4} \times \frac{I}{c}$ to the pressure.

Thus total pressure is $P = \frac{2}{4} + \frac{3}{4} \times \frac{I}{c} = \frac{5}{4} \frac{I}{c}$

Answer **C**.

34.03-03 Intensity and Pressure of Light 2006-9-14