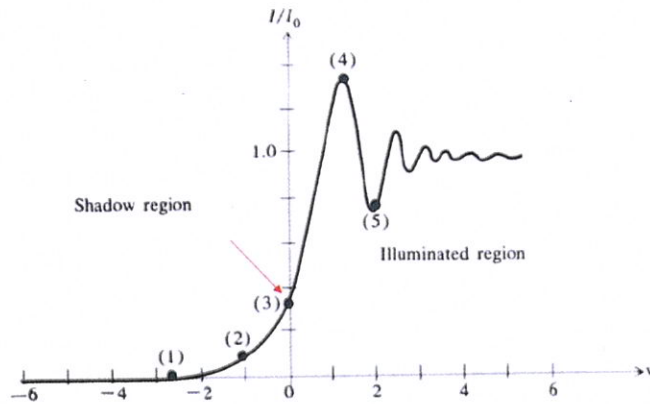


Quiz #4
 EC4214
 2021.11.10
 Name:

In Fig. 5.25 (see below figure), explain the value of I/I_0 at $v=0$. What is I_0 ?



(b)



Sol.) In the Fresnel diffraction equation,
 the given intensity is denoted by U_1 for U_p .
 In the Cornue spiral, at $v=0$, $U_0 = \sqrt{2} U_1$, where
 $\sqrt{2}$ is the distance for $-\infty$ to ∞ orders.
 In the new notation of $v/p = \frac{U_0}{\sqrt{2}} [C + i S]^{1/2}$,
 thus, U_0 is for the unblocked case.
 The reason of $\frac{1}{4} I_0$ at $v=0$ for Fig. 5.25 is because
 half the region is blocked, resulting in $\frac{1}{4}$ in intensity
 due to the symmetry.