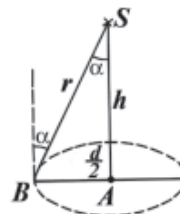# 2-mavzu: Fotometrik kattaliklar. Yorug'lik kuchi, yoritilganlik, ravshanlik, yorug'lik oqimi.

1-masala. To'liq yorug'lik oqimi 1300 lm bo'lgan lampa stol markazidan 2 m balandlikta osilgan . Diametri 1,5 m bo'lgan dumaloq stolning markazida va chetida yoritilganlik qanday bo'ladi?

Berilgani: $\Phi_0 = 1300$ lm; $h = 2$m; $d = 1,5$ m.

Topish kerak: E_A-? E_B-?

Yechilishi:

Stol markazining yoritilganligi $E_A = \dfrac{I}{h^2}$, bunda $I = \dfrac{\Psi_0}{4\pi}$.

Mos ravishta bunı yozsak $E_A = \dfrac{\Phi_0}{4\pi h^2}$. Stol chetining yoritilganligi:

$E_B = \dfrac{1}{r^2} \bullet cos\alpha$, Rasmdan : $r = \sqrt{h^2 + \left(\dfrac{d}{2}\right)^2}$, $cos\alpha = \dfrac{h}{\sqrt{h^2 + \left(\dfrac{d}{2}\right)^2}}$, bunda:

$$E_B = \dfrac{\Phi_0}{4\pi\left[h^2 + \left(\frac{d}{2}\right)^2\right]} \bullet \dfrac{h}{\sqrt{h^2 + \left(\frac{d}{2}\right)^2}}.$$

Yechilishi:

$E_A = \dfrac{1300 \ lm}{43,144 \ m^2} = 26$ lx; $E_B = \dfrac{1300 \ lm}{4 \bullet 3,14 \bullet (4 + 0,75^2)m^2} = 21$ lx.

2-masala: Prizmada nurlar yo'li

Shart: Sindirish burchagi 60° bo'lgan prizmaga nur 30° burchak ostida tushadi. Shishaning sinish ko'rsatkichi $n = \sqrt{3}$ bo'lsa, nurning og'ish burchagini toping.

Yechimi:

1. Birinchi sirtda sinish: $\dfrac{sin30°}{sin\beta_1} = \sqrt{3}$; $sin\beta_1 = \dfrac{1}{2\sqrt{3}}$; $\beta_1 \approx 16.8°$

2. Prizma ichidagi bog'liqlik: $\beta_1 + \beta_2 = A$; $\beta_2 = 60° - 16.8° = 43.2°$

3. Ikkinchi sirtda chiqish: $\dfrac{\sin \beta_2}{\sin \gamma} = \dfrac{1}{n}$; $\sin \gamma = \sqrt{3}$; $\sin 43.2° \approx 1.73 \cdot 0.68 > 1$

4. Nur ikkinchi sirtda to'la ichki qaytishga uchraydi va prizmadan chiqmaydi.

Javob: Nur prizmadan chiqmaydi.