d) $\frac{P_{rad}}{2} = \int_0^{2\pi}\int_0^{\theta^*} \overbrace{U(\theta,\phi)}^{=B_0\cos^3\theta} \sin\theta \, d\theta \, d\phi = 2\pi \frac{2P_{rad}}{\pi}\left(-\frac{\cos^4(\theta)}{4}\Big|_0^{\theta^*}\right)$

$\Rightarrow \frac{P_{rad}}{2} = \left[-\frac{\cos^4(\theta^*)}{4} + \underbrace{\frac{\cos^4(0)}{4}}_{=1/4}\right] 2\pi \frac{2P_{rad}}{\pi}$

$\Rightarrow \frac{1}{2\pi} = -\cos^4(\theta^*) + 1 \Rightarrow \cos^4(\theta^*) = 1/2 \Rightarrow \boxed{\theta^* = 32{,}7^\circ}$

$\cos(\theta^*) = 0{,}84$