

According to illuminance wiki page (<http://en.wikipedia.org/wiki/Illuminance>), the formula to calculate illuminance is:

$$E_v = \frac{I_v}{h^2} \cos^3(\theta)$$

Where  $I_v = L_v * Area$ ,  $L_v$  is 500 cd/m<sup>2</sup> as explained, Area is  $2 * \pi * (D/2)^2$   
 $h = r * \cos(\theta)$

Hence

$$I_v = 500 * \pi * (D/2)^2 = 0.9817 \text{ cd}$$

$$E_v = \frac{I_v}{(r * \cos(\theta))^2} * \cos^3(\theta) = \frac{I_v}{r^2} * \cos(\theta)$$

$$= 0.9817 / 0.5^2 * \cos(\pi/6) = 3.4009 \text{ lm/m}^2$$