

INTENSITY PROBLEMS

1. An isotropic source radiates a total luminous flux of 75 lumens. What is the luminous intensity of the source?
2. A light source radiates a luminous flux of 5 lumens into a cone of half-angle 25° . What is the intensity of the source?
3. An illuminance meter is aimed at a 10 cd source from a distance of 15 ft and is rotated to give maximum needle deflection. What is the illuminance reading?
4. Two 100 candela street lights are mounted 10 ft above the sidewalk and 20 ft apart. If the lights can be treated as isotropic point sources, what is the illuminance of the sidewalk (a) directly under one of the lights, and (b) midway between the two lights?
5. An illuminance meter in the presence of a point light source is rotated until its needle has maximum deflection with the reading 100 ft-cd. Through what angle must the meter be tilted to give a reading of 50 ft-cd?
6. A 150 cd isotropic light source is placed at the center of a sphere of radius 2 ft. What is the illuminance of the inside surface of the sphere?
7. A small 500 cd light bulb is suspended 4 m above the center of a ramp which has a 35° incline. What is the illuminance of the center of the ramp?

ANSWERS

1. 5.97 cd
2. 8.5 cd
3. 4.44×10^{-2} lm/ft²
4. (a) 1.09 lm/ft²; (b) 0.707 lm/ft²
5. 60°
6. 37.5 lm/ft²
7. 25.6 lm/m²