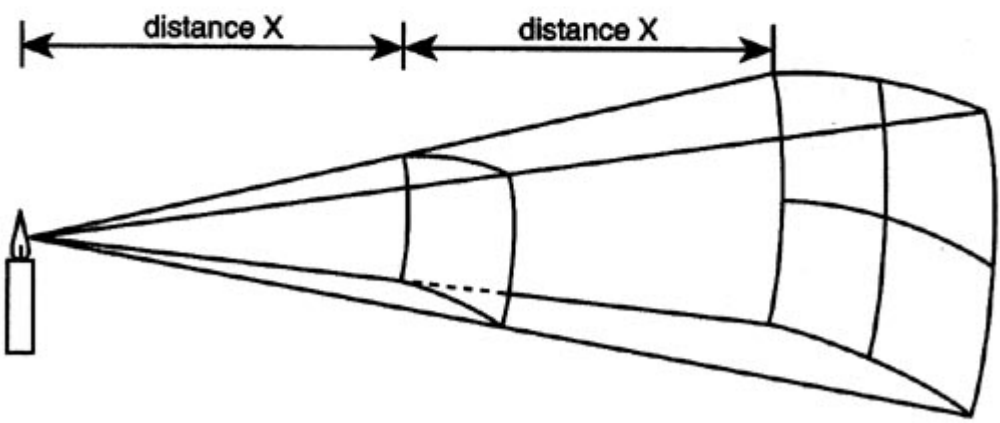
INVERSE SQUARE LAW A statement of the fact that the illuminance, irradiance, or flux density produced by a point source is inversely proportional to the square of the distance from the source. This law is easily rationalized by imagining the total instantaneous output of photons from a point source as being a sphere with a radius equal to the speed of light multiplied by the elapsed time since the emission of the photons. Since the number of photons remains constant while the area of the sphere increases as the square of its radius (area of a sphere = $4\pi r^2$), the density of the photons decreases as the square of the distance or radius. For example, if the illuminance falling on a surface 1 meter from a 32 candela source is 32 lux, the illuminance from the same source at 4 meters will be 2 lux. This law can be expressed mathematically by the equation: $E = I/d^2$ where E is the illuminance produced by a point source with intensity I at a distance d. It is important to note that the inverse square law applies only to sources that approximate point sources. Other relations exist for other source distributions. For example, for an infinite linear source $E = I/d$, and for an infinite planar source, E is invariant with d. *J. Holm*



Inverse Square Law. Light originates from an approximate point source. If the distance from the light source is doubled, the area illuminated by the same amount of light from the source is two squared, or four times the original area. This means that the illuminance produced by a point source goes as the inverse of the square of the distance of the surface.