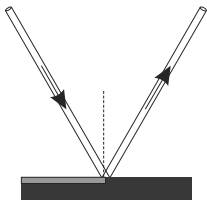


Mirror reflection

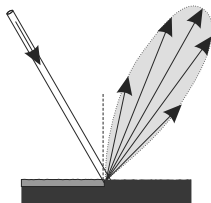


$$\sigma/\lambda \approx 0$$

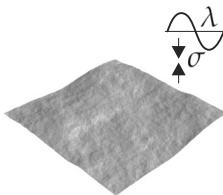


$$\sigma \approx 0$$

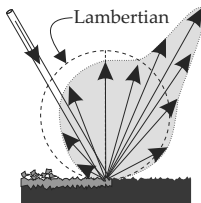
Specular reflection



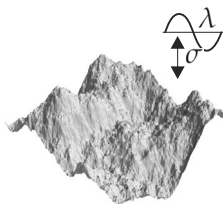
$$0 < \sigma/\lambda < 0.2$$



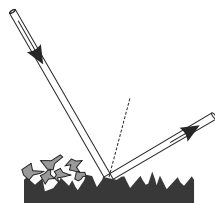
Diffuse reflection



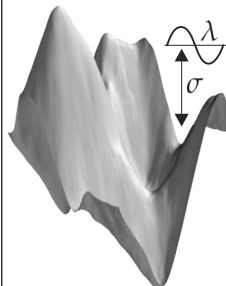
$$0.2 < \sigma/\lambda < 1$$



Geometric reflection



$$1 < \sigma/\lambda$$



σ is the root-mean-square surface roughness
 λ is the wavelength of the light

Geometric optics

Bidirectional reflection function

Geometric optics

(a)

(b)

(c)

(d)