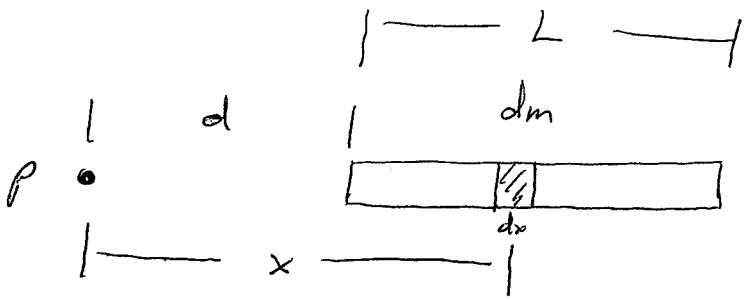
Determine the gravitational field strength at P.



$$\frac{F}{m} = \frac{GM}{r^2}$$

$$\lambda = \frac{M}{L}$$

$$dM = \lambda\, dx$$

$$r^2 = x^2$$

$$\frac{dF}{m} = \frac{G\, dM}{x^2}$$

$$\int \frac{dF}{m} = \int_{d}^{d+L} \frac{G\ \lambda\, dx}{x^2}$$

$$\frac{F}{m} = G\lambda \int_{d}^{d+L} \frac{dx}{x^2}$$

$$= G\lambda \left[-\frac{1}{x} \Big|_{d}^{d+L} \right]$$

$$= G\lambda \left[\frac{-1}{d+L} + \frac{1}{d} \right]$$

$$\frac{F}{m} = G\frac{M}{L}\left(\frac{1}{d} - \frac{1}{d+L}\right)$$

$$= \frac{GM}{L}\left(\frac{d+L - d}{d(d+L)}\right)$$

$$\boxed{\frac{F}{m} = \frac{GM}{d(d+L)}}$$