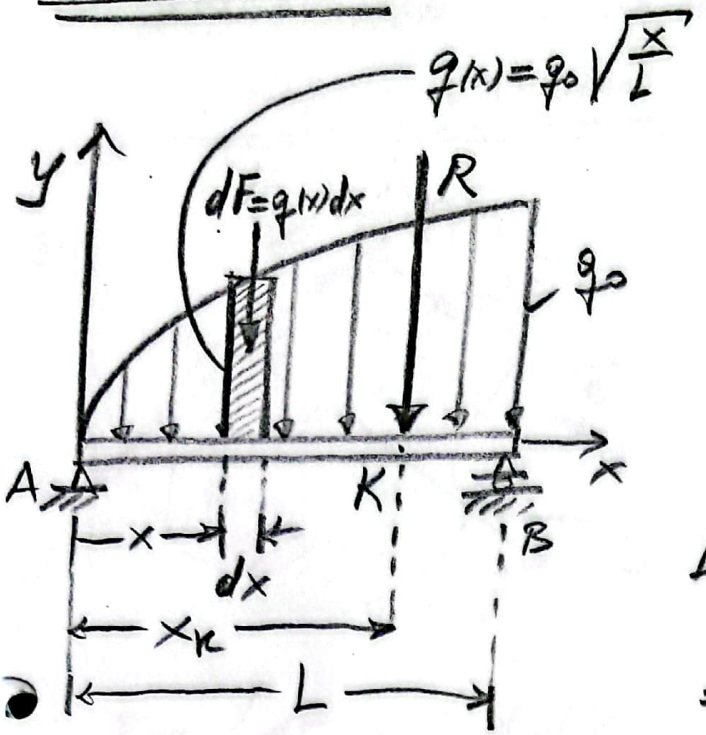
ΑΣΚΗΣΗ 4-4

Συνισταμένη παραλλήλων φορτίων



Θεωρία

$$R=\int_0^L q(x)dx =$$

$$=\frac{q_0}{\sqrt{L}}\int_0^L x^{\frac{1}{2}}dx =$$

$$=\frac{q_0}{\sqrt{L}}\left[\frac{x^{\frac{1}{2}+1}}{\frac{1}{2}+1}\right]_0^L = \frac{2q_0}{3\sqrt{L}}L^{\frac{3}{2}} = \frac{2q_0}{3\sqrt{L}}L\sqrt{L} = \frac{2q_0L}{3}$$

Θεωρία

$$x_K=\frac{\int_0^L x\,q(x)dx}{\int_0^L q(x)dx} \qquad \left(\int_0^L q(x)dx=\frac{2q_0L}{3}\right)$$

$$\int_0^L x\,q(x)dx=\frac{q_0}{\sqrt{L}}\int_0^L x^{\frac{3}{2}}dx=\frac{q_0}{\sqrt{L}}\left[\frac{x^{\frac{3}{2}+1}}{\frac{3}{2}+1}\right]_0^L =$$

$$=\frac{2q_0}{5\sqrt{L}}L^{\frac{5}{2}}=\frac{2q_0}{5\sqrt{L}}L^2\sqrt{L}=\frac{2q_0L^2}{5}$$

$$x_K=\frac{2q_0L^2}{5}\cdot\frac{3}{2q_0L}=\frac{3L}{5}$$

Σαρώθηκε με το CamScanner