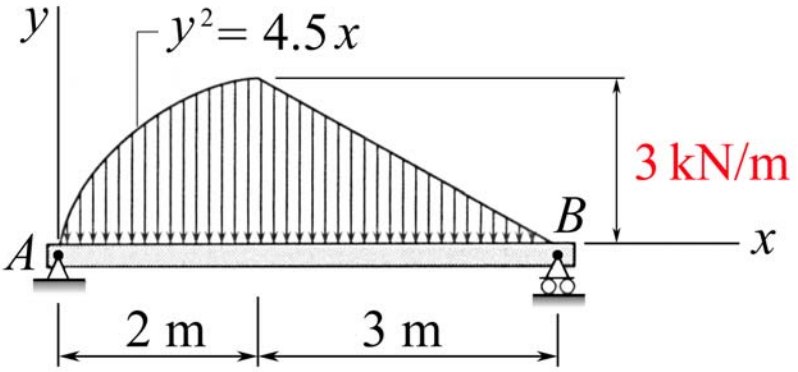
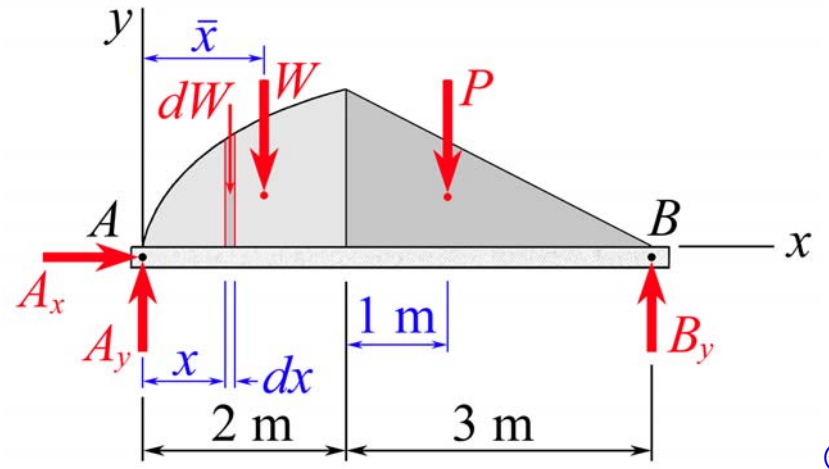
MEEG 2003
Quiz #6.m19

A beam *AB* carries a distributed load as shown. Determine the reaction forces **A** and **B** at supports *A* and *B*.





②

$dW = y\,dx = (3/\sqrt{2})\,x^{1/2}dx \qquad W = \int_0^2 (3/\sqrt{2})\,x^{1/2}dx = 4 \qquad W = 4 \text{ kN}$ ②

$P = \frac{1}{2}(3)(3) = 4.5 \qquad P = 4.5 \text{ kN}$ ①

$\bar{x}W = \int x\,dW = \int_0^2 (3/\sqrt{2})\,x^{3/2}dx = 4.8 \qquad \bar{x} = 1.2 \text{ m}$ ①

$+\circlearrowleft \Sigma M_A = 0: \quad 5B_y - \bar{x}W - 3P = 0 \qquad B_y = 3.66 \text{ kN}$ ①

$+\uparrow \Sigma F_y = 0: \quad A_y - W - P + B_y = 0 \qquad A_y = 4.84 \text{ kN}$ ①

$\pm\rightarrow \Sigma F_x = 0: \quad A_x = 0 \qquad \mathbf{A} = 4.84 \text{ kN} \uparrow$ ①

$\mathbf{B} = 3.66 \text{ kN} \uparrow$ ①