

NAME:

Quiz 05: Chapter 05

Replace the distributed load shown with two equivalent forces F_1 and F_2 . Draw the free body diagram and determine the reaction forces at A and B .

$$F_1 = (200 \text{ N/m})(7 \text{ m}) = 1400 \text{ N}$$

$$x_1 = 3.5 \text{ m}$$

$$F_2 = \frac{1}{2} (200 \text{ N/m})(3 \text{ m}) = 300 \text{ N}$$

$$x_2 = \left(4 \text{ m} + \frac{2}{3} (3 \text{ m}) \right) = 6 \text{ m}$$

$$\sum M_A = B(7 \text{ m}) - F_1 x_1 - F_2 x_2 = 0$$

$$B = \frac{(1400 \text{ N})(3.5 \text{ m}) + (300 \text{ N})(6 \text{ m})}{(7 \text{ m})} = 957 \text{ N}$$

$$\sum M_B = F_1(7 - x_1) + F_2(7 - x_2) - A(7 \text{ m}) = 0$$

$$A = \frac{(1400 \text{ N})(3.5 \text{ m}) + (300 \text{ N})(1 \text{ m})}{(7 \text{ m})} = 743 \text{ N}$$

