9–122. The loading acting on a square plate is represented by a parabolic pressure distribution. Determine the magnitude of the resultant force and the coordinates (\( \bar{x}, \bar{y} \)) of the point where the line of action of the force intersects the plate. Also, what are the reactions at the rollers B and C and the ball-and-socket joint A? Neglect the weight of the plate.

![Diagram of a plate with pressure distribution](image)

9–109. The concrete "gravity" dam is held in place by its own weight. If the density of concrete is \( \rho_c = 2.5 \text{ Mg/m}^3 \), and water has a density of \( \rho_w = 1.0 \text{ Mg/m}^3 \), determine the smallest dimension \( d \) that will prevent the dam from overturning about its end A. The resultant force exerted by the water on the dam acts in the horizontal direction, is applied at 2/3 of the surface and has a magnitude of \( F = \rho_w gH \).

![Diagram of a dam](image)

9–119. The load over the plate varies linearly along the sides of the plate such that \( p = 10[y(2 - x)] \text{ lb/ft}^2 \). Determine the magnitude of the resultant force and the coordinates (\( \bar{x}, \bar{y} \)) of the point where the line of action of the force intersects the plate.

![Diagram of a plate with varying load](image)