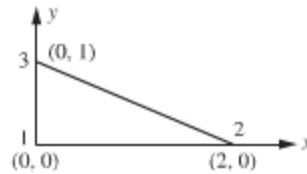## MCE 466 – Homework Assignment #5

Text problems 6.3c, 6.11b, 6.13

6.3 Evaluate the stiffness matrix for the elements shown in Figure P6–3. The coordinates are in units of inches. Assume plane stress conditions. Let $E = 30 \times 10^6$ psi, $v = 0.25$, and thickness $t = 1$ in.

(c)

6.11 Determine the nodal forces for (1) a linearly varying pressure p_x on the edge of the triangular element shown in Figure P6–11(a); and (2) the quadratic varying pressure shown in Figure P6–11(b) by evaluating the surface integral given by Eq. (6.3.7). Assume the element thickness is equal to t.

$$p_x = p_0 \frac{y^2}{L^2}$$
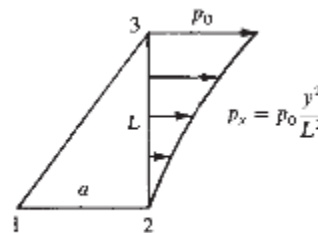
(b)

6.13 Determine the nodal displacements and the element stresses, including principal stresses, for the thin plate of Section 6.5 with a uniform shear load (instead of a tensile load) acting on the right edge, as shown in Figure P6–13. Use $E = 30 \times 10^6$ psi, $v = 0.30$, and $t = 1$ in. (*Hint:* The $[K]$ matrix derived in Section 6.5 and given by Eq. (6.5.22) can be used to solve the problem.)

$s = 1000$ lb/in.

10 in.

20 in.