Ejercicio 13

miércoles, 8 de junio de 2022 08:36 a. m.

$q_x^{(\tau)} = 0.30$ $\quad$ $q_x^{\prime(d)} = 0.022$

Encontrar $q_x^{(w)}$

$q_x^{(\tau)} = q_x^{(d)} + q_x^{(w)}$

$q_x^{(d)} = q_x^{(\tau)} - q_x^{(w)}$

$$q_x^{\prime(d)} = q_x^{(d)}\left(1 + \frac{1}{2} q_x^{(w)}\right)$$

$$q_x^{\prime(d)} = \left(q_x^{(\tau)} - q_x^{(w)}\right)\left(1 + \frac{1}{2} q_x^{(w)}\right)$$

$$0.022 = \left(0.30 - q_x^{(w)}\right)\left(1 + \frac{1}{2} q_x^{(w)}\right)$$

$$0.022 = \left(0.30 + 0.15 q_x^{(w)} - q_x^{(w)} - \frac{1}{2} q_x^{(w)^2}\right)$$

$$0 = 0.278 - 0.85 q_x^{(w)} - \frac{1}{2} q_x^{(w)^2}$$

$$\frac{1}{2} q_x^{(w)^2} + 0.85 q_x^{(w)} - 0.278 = 0$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \qquad q_x^{(w)} = \frac{-0.85 \pm \sqrt{(0.85)^2 + 4\left(\frac{1}{2}\right)(0.278)}}{2\left(\frac{1}{2}\right)}$$

$= 0.2807$