2.13

If $(c_{prod}, p_{prod}) = (c_1, p_1) \times (c_2, p_2)$ and $c_1, p_1, c_2, p_2 > 0$,

$$(\text{lower-bound}_{prod}, \text{upper-bound}_{prod}) = ((c_1 - (c_1 p_1))(c_2 - (c_2 p_2)), (c_1 + (c_1 p_1))(c_2 + (c_2 p_2))) \tag{1}$$
$$(\text{lower-bound}_{prod}, \text{upper-bound}_{prod}) = ((c_1 c_2 (1 - p_1)(1 - p_2), c_1 c_2 (1 + p_1)(1 + p_2)) \tag{2}$$
$$\tag{3}$$
$$c_{prod} = \frac{1}{2}(c_1 c_2 (1 - p_1)(1 - p_2) + c_1 c_2 (1 + p_1)(1 + p_2)) \tag{4}$$
$$c_{prod} = \frac{c_1 c_2}{2}((1 - p_1)(1 - p_2) + (1 + p_1)(1 + p_2)) \tag{5}$$
$$c_{prod} = \frac{c_1 c_2}{2}(1 - p_1 - p_2 + p_1 p_2 + 1 + p_1 + p_2 + p_1 p_2) \tag{6}$$
$$c_{prod} = \frac{c_1 c_2}{2}(2 + 2 p_1 p_2) \tag{7}$$
$$c_{prod} = c_1 c_2 (1 + p_1 p_2) \tag{8}$$
$$\tag{9}$$
$$p_{prod} = \frac{\text{upper-bound}_{prod} - c_{prod}}{c_{prod}} \tag{10}$$
$$p_{prod} = \frac{c_1 c_2 (1 + p_1)(1 + p_2) - c_1 c_2 (1 + p_1 p_2)}{c_1 c_2 (1 + p_1 p_2)} \tag{11}$$
$$p_{prod} = \frac{(1 + p_1)(1 + p_2) - (1 + p_1 p_2)}{1 + p_1 p_2} \tag{12}$$
$$p_{prod} = \frac{1 + p_1 + p_2 + p_1 p_2 - 1 - p_1 p_2}{1 + p_1 p_2} \tag{13}$$
$$p_{prod} = \frac{p_1 + p_2}{1 + p_1 p_2} \tag{14}$$

For small values of p_1 and p_2, $\cancel{p_1 p_2} \to 0$.
$\therefore p_{prod} \approx p_1 + p_2$.