

3. (14 points)

Ray-D-O's! is considering modifying the design of its popular radio so that the component boards can be soldered without flux, a substance that requires the use of a toxic solvent in the cleanup process. The company is currently spending \$4 to manufacture each additional unit. The new design would save \$0.75 per unit, as the flux would no longer need to be purchased or cleaned off the radio's component board. It would however, require an upgrade to the workstations to allow for more precise soldering. That upgrade would add \$25 per hour to the cost of running the plant. Assume there are 20 production days per month, and the plant runs two eight-hour shifts per day. This company is a small operation with only one worker per shift.

a) Over what range of radio production would it prefer each of the radio designs? Assume that all of the available hours would be used producing the radios.

$$4x = 8,000 + 0.75x$$

$$3.25x = 8,000$$

$$x = 2461$$

$$16 \text{ prod hrs / day} \times 20 \text{ days / MO} = 320 \text{ hrs / MO}$$

$$\begin{array}{r} 320 \text{ hrs} \\ \times 25 / \text{HR} \\ \hline \$8,000 / \text{MO} \end{array}$$

b) Suppose that the company is going to produce 9,000 radios per month. How much would the new design have to save per unit in order for the company to be indifferent between the two design options?