

Midterm 2 Extra Credit

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Question

Bob's Burgers has a production function of $Q = \sqrt{KL}$, where L denotes workers and K denotes burger flipping machines, and Q is measured in hundreds. Because Bob is racist and will not hire nonwhite workers, he has a fixed number of workers $\bar{L} = 4$ in the short term. The prevailing wage rate is 20 and the prevailing rental rate is 5. What is the ideal number of burger flipping machines that Bob should order, and how many burgers can he produce?

Solution

$$\begin{aligned}Q &= \sqrt{KL} \\MRTS_{KL} &= \frac{\frac{\sqrt{L}}{2\sqrt{K}}}{\frac{\sqrt{K}}{2\sqrt{L}}} \\ \frac{L}{K} &= \frac{5}{20} \\ L &= \frac{K}{4} \\ 4 &= \frac{K}{4} \\ K &= \boxed{16} \\ Q &= \sqrt{(16)(4)} \\ &= \boxed{8}\end{aligned}$$