

$$f(L, K) = 100 K^{0.5} L^{0.5}$$

$$\bar{K} = 9$$

$$f(L, \bar{K}) = 100(9)^{0.5} L^{0.5} = 100(3) L^{0.5}$$

$$f(L, \bar{K}) = 300 L^{0.5}$$

$$f(L, K) = K^{0.33} L^{0.67}$$

$$MP_L = \frac{\partial f(\cdot)}{\partial L} = K^{0.33} \underbrace{0.67}_{0.67-1} L$$

$$MP_L = 0.67 K^{0.33} L^{-0.33}$$

$$MP_L = 0.67 \frac{K^{0.33}}{L^{0.33}}$$

$$f(L, K) = 4 K^{0.5} L^{0.5}$$

$$MP_K = \frac{\partial f(\cdot)}{\partial K} = (0.5) 4 K^{0.5-1} L^{0.5}$$

$$MP_K = 2 K^{-0.5} L^{0.5}$$

$$MP_K = 2 \frac{L^{0.5}}{K^{0.5}}$$



$$f(L, K) = 4 K^{0.75} L^{0.25}$$

$$MP_K = \frac{\partial f(\cdot)}{\partial K} = 4 (0.75) K^{0.75-1} L^{0.25}$$

$$MP_K = 3 K^{-0.25} L^{0.25}$$

$$MP_K = 3 \frac{L^{0.25}}{K^{0.25}}$$

$$\begin{aligned} MRTS_{LK} &= \frac{MP_L}{MP_K} = \frac{K^{0.75} L^{-0.75}}{3 K^{-0.25} L^{0.25}} \\ &= \frac{1}{3} \frac{K^{0.75}}{L^{0.25}} \frac{L^{0.75}}{K^{0.75}} = \frac{1}{3} \frac{K}{L} = \frac{K}{3L} \end{aligned}$$

$$\frac{w}{r} = \frac{2}{10} = \frac{1}{5}$$

$$\frac{K}{L} = \frac{3}{5}$$

$$K_1 = \frac{3}{5} L$$