

19. Suppose that a firm has the following Cobb–Douglas production function: $Q = 12K^{0.75}L^{0.25}$.
- What must its long-run total cost curve look like? Its long-run average total cost curve?
 - How do your answers to part (a) change if the firm's production function is $Q = KL$?
 - Using the original production function and supposing that each unit of capital costs R and each unit of labor costs W , what is the short-run demand for labor if capital is fixed at 16 units in the short run?
 - Maintaining the assumptions in part (c), what are the firm's short-run total cost and short-run marginal cost?
 - Maintaining the assumptions in part (c), derive the long-run demands for capital and labor.
 - Maintaining the assumptions in part (c), derive the total cost curve for this firm.
 - Maintaining the assumptions in part (c), derive the long-run average and marginal cost curves.
 - Maintaining the assumptions in part (c), how do marginal and average costs change with increases in output? Explain.
 - Maintaining the assumptions in part (c), confirm that the value of the Lagrange multiplier you get from the cost-minimization problem is equal to the marginal cost curve.
 - Repeat parts (c) through (i) for the production function $Q = KL$.