



5. Consider the short run production function  $Q = 10L - 0.5L^2$  where labor (L) is the only variable input. What is the average product when labor equals 4?
- 6.
  - 8.
  - 12.
  - 32.
6. Consider the production function  $Q = K^{0.5}L^{0.75}$  where K is capital and L is labor. Which of the following statements about this production function is true?
- Its exhibits decreasing returns to scale.
  - Its exhibits constant returns to scale.
  - Its exhibits increasing returns to scale.
  - It exhibits decreasing, increasing, or constant returns to scale depending on how much capital and labor are used.

7. Which of the following statements must be **true**?
- a. Short run average cost is increasing when short run marginal cost is above short run average cost.
  - b. Short run average cost is increasing when short run marginal cost is below short run average cost.
  - c. Short run average cost is increasing when short run marginal cost is increasing.
  - d. Short run average cost is increasing when short run marginal cost is decreasing.

8. Consider the long-run total cost function  $LTC = 2,000Q - 50Q^2 + 0.5Q^3$ . Which of the following statements is true?
- a. Long-run average cost is decreasing.
  - b. Long-run average cost is constant.
  - c. Long-run average cost is increasing.
  - d. Long-run average cost is U-Shaped.

9. Consider the production function  $Q = K^{0.5}L^{0.5}$  where  $K$  is capital and  $L$  is labor. Suppose capital is fixed at 400 in the short-run.
- What are the short-run total, average, and marginal product?
  - Assuming the price of capital is  $r = \$100$  and the price of labor is  $w = \$25$ , what are the fixed, variable, and total cost?
  - Again assuming the price of capital is  $r = \$100$  and the price of labor is  $w = \$25$ , what are the average fixed, average variable, and average total cost?
  - What is the marginal cost?

10. Consider the production function  $Q = K^{1.5}L^{0.5}$  where  $K$  is capital and  $L$  is labor.
- Find the marginal rate of technical substitution for this production function.
  - Suppose the price of capital is  $r = \$60$  and the price of labor is  $w = \$20$ . What is the output expansion path given these prices?
  - What are long-run total cost, long-run average cost, and long-run marginal cost?