**Solutions to the production problems**

1. See Table 1.



**Table 1**

* 1. Labor is the fixed input while capital is the variable input.
  2. Fixed costs are 20($15) = $300.
  3. To produce 475 units in the least-cost manner requires 6 units of capital, which cost $75 each. Thus, variable costs are ($75)(6) = $450.
  4. Using the *VMPK* = *r* rule, *K = 5* maximizes profits.
  5. The maximum profits are .
  6. There are increasing marginal returns when *K* is between 0 and 3.
  7. There are decreasing marginal returns when *K* is between 3 and 11.
  8. There are negative marginal returns when *K* is greater than 7.

1. Since , the firm is not using the cost minimizing combination of labor and capital. To minimize costs, the firm should use more labor and less capital since the marginal product per dollar spent is greater for labor: .

