

ECON 201, Prof. Hogendorn: Problem Set #6

1. Consider the production function $f(x_1, x_2) = (x_1^{0.5} + x_2^{0.5})^2$.
 - (a) What is the formula for MRTS? What is the MRTS when $x_1 = x_2 = 10$?
 - (b) Does this production function exhibit decreasing, constant, or increasing returns to scale?

2. The Funkwalder Corporation has called for bids on a contract to produce 20,000 borchnagles. (If any of you happen to get a Wharton MBA, prepare for more on Funkwalder and borchnagles.) The two main producers of borchnagles are Delaware Borchnagle Corp. and Borchnagles de Québec (it's pronounced borsh-nahg-la in French).

Delaware Borchnagle's production function for borchnagles is $f_D(L, K) = 8L^{0.5}K^{0.5}$. In Delaware, labor costs \$4 and capital costs \$16.

Borchnagles de Québec's production function is $f_Q(L, K) = 10L^{0.4}K^{0.6}$. In Quebec, labor costs \$5 and capital costs \$12. (All costs in U.S. dollars.)

The firms will keep trying to outbid each other by lowering their bids as long as they will not incur an outright loss from fulfilling the contract. Who will win the Funkwalder contract? How much will the winner bid?

3. Consider the cost curves of Borchnagles de Québec:
 - (a) Suppose that in the short run, capital is fixed at $K = 1000$. What is the short-run total cost curve? What is the short-run average cost curve? What is the short-run marginal cost curve?
 - (b) Find the intersection of the marginal and average cost curves.
 - (c) What is the long-run total cost curve? The long-run average cost curve? The long-run marginal cost curve?