

## Answers to Hmwk #6

1) a)  $L^{1/2} K^{1/2} \rightarrow 3 \cdot 2 = 6$   
b)  $(2L)^{1/2} (2K)^{1/2} = 2^{1/2} 2^{1/2} L^{1/2} K^{1/2} = 2F(K,L)$   
output doubles

c) constant

d)  $\frac{\partial F}{\partial L} = \frac{1}{2} L^{-1/2} K^{1/2} = \frac{1}{2} \left(\frac{2}{3}\right) = \frac{1}{3}$

e)  $\frac{\partial F}{\partial K} = \frac{1}{2} L^{1/2} K^{-1/2} = \frac{1}{2} \left(\frac{3}{2}\right) = \frac{3}{4}$

f)  $MRTS = \frac{\partial F / \partial L}{\partial F / \partial K} = \frac{\frac{1}{2} L^{-1/2} K^{1/2}}{\frac{1}{2} L^{1/2} K^{-1/2}} = \frac{K}{L} = \frac{4}{9}$

2) a)  $12(2L) + 4(2K) = 2(12L + 4K) = 2F(K,L)$  constant

b)  $\frac{\partial F}{\partial L} = 12$  when  $K \uparrow$  or  $\downarrow$   $\frac{\partial F}{\partial L}$  doesn't change

c)  $MRTS = \frac{\partial F / \partial L}{\partial F / \partial K} = \frac{12}{4} = 3$

3) a)  $\frac{\partial F}{\partial X} = \frac{1}{X^{3/4} Y^{1/4}} \cdot \frac{3}{4} X^{-1/4} Y^{1/4} = \frac{3}{4X} = P_x = 4$

b)  $\frac{\partial F}{\partial Y} = \frac{1}{X^{3/4} Y^{1/4}} \cdot \frac{1}{4} X^{3/4} Y^{-3/4} = \frac{1}{4Y} = P_y = 3$

4) a)  $\frac{\partial B}{\partial L} = \frac{5}{6} L^{-1/6} F^{1/6}$        $\frac{\partial B}{\partial K} = \frac{1}{6} L^{5/6} K^{-5/6}$        $MRTS = \frac{5K}{L}$

b)  $B(2L, 2K) = (2L)^{5/6} (2K)^{1/6} = 2^{5/6} 2^{1/6} L^{5/6} K^{1/6} = 2B(L, K)$   
constant