

REVIEW QUESTIONS

1. Good 1 is normal, good 2 is normal and the two goods are substitutes (but not perfect substitutes). Using budget lines and indifference curves, illustrate the effect of an **increase in p_2** on the consumption of both x_1 and x_2 . Label income and substitution effects for both goods
2. My utility function is $U(x_1, x_2) = x_1^3 x_2 + 8$ and my utility-maximizing bundle (at existing prices and my income) consists of 3 units of x_1 and 2 units of x_2 . If $p_1 = 10$, what must p_2 equal?
3. A consumer has preferences over leisure, L_e , and disposable income, I . Use budget lines and indifference curves to illustrate the case where a simultaneous halving of the wage rate and a doubling of non-wage income would have no effect on her optimal choice of **disposable income**.
4.
 - a. Using indifference curves and budget lines in the (c_1, c_2) plane, illustrate a situation in which an increase in the interest rate, r , causes someone who was originally **saving** to save **less**.
 - b. Does the substitution effect cause the person to save more or less? Explain why. (Just use logic—you don't need to draw or label income and substitution effects, unless you want to).
5.
 - a. If $STC(Q, w, r, \bar{K}) = wQ^2/(\bar{K}+1) + r\bar{K}$, what is that firm's production function?
 - b. A firm's short-run total cost function, $STC(Q, w, r, \bar{K})$ is such that $STC(10, 2, 3, 4) = 40$. How much **labor** does the firm use to produce 10 units of output?
6. A firm's long run cost minimizing inputs for $Q=10$ units of output, when $w=2$ and $r=3$, are $L^*(10, 2, 3)$ and $K^*(10, 2, 3)$.
 - a. Is $MP_L(L^*, K^*)$ greater than, less than, or equal to $MP_K(L^*, K^*)$ at these wage and rental rates and this quantity? Prove or explain.
 - b. In words, what is an isoquant?
7. Prove that $F(L, K) = L^\alpha K^\beta$ exhibits increasing returns to scale if $\alpha + \beta > 1$.
8. A firm uses workers and jack-hammers to break up asphalt (so that roads may be repaved). Each worker must use a jack-hammer, which he uses to break up 20 square feet of asphalt in an hour. Workers cost $w_0 = 8$ \$/hr and jack-hammers cost $r_0 = 2$ \$/hr.
 - a) What is the long-run total cost of breaking 1000 square feet of asphalt per hour?
 - b) What is the long-run total cost of breaking Q square feet of asphalt per hour? (In other words, what is $LTC(Q, w_0, r_0)$?
9. Suppose $F(L, K) = LK$ and $w_0 = r_0 = 4$. Is $L^*(Q, w_0, r_0)$ greater than, less than, or equal to $K^*(Q, w_0, r_0)$? Show your work.
10. If a firm is currently at the input bundle (L_0, K_0) and we have $MP_L(L_0, K_0) = 17$
 - a. In words, what does " $MP_L(L_0, K_0) = 17$ " mean?
 - b. How would a small increase in the firm's labor usage affect the firm's average product of CAPITAL? (Explain.)