

EXERCISES CHAPTER 12

Exercise 1. For each production function, what are two other bundles on the same isoquant as the bundle $(4, 4)$?

(a) $f(x_1, x_2) = 3x_1 + 2x_2$

(b) $f(x_1, x_2) = x_1^{\frac{1}{2}} + x_2^{\frac{1}{2}}$

(c) $\min\{x_1, x_2\}$

Exercise 2. For each of the following production functions, determine the marginal product of x_1 and x_2 .

(a) $f(x_1, x_2) = 3x_1 + 2x_2$

(b) $f(x_1, x_2) = x_1^{\frac{1}{2}} + x_2^{\frac{1}{2}}$

(c) $f(x_1, x_2) = x_1x_2$

(d) $f(x_1, x_2) = x_1^{\frac{1}{2}}x_2^{\frac{1}{4}}$

Exercise 3. For each of the following production functions, determine whether the production functions has decreasing marginal product for x_1 . What about x_2 ?

(a) $f(x_1, x_2) = 3x_1 + 2x_2$

(b) $f(x_1, x_2) = x_1^{\frac{1}{2}} + x_2^{\frac{1}{2}}$

(c) x_1x_2

(d) $f(x_1, x_2) = x_1^{\frac{1}{2}}x_2^{\frac{1}{4}}$

Exercise 4. For each of the following production functions, if both inputs are increased by $t > 1$, does output change by more, less, or exactly t ? Does this suggest the production function has increasing, decreasing, or constant returns to scale?

(a) $f(x_1, x_2) = 3x_1 + 2x_2$

(b) $f(x_1, x_2) = x_1^{\frac{1}{2}} + x_2^{\frac{1}{2}}$

(c) $f(x_1, x_2) = x_1x_2$

(d) $f(x_1, x_2) = x_1^{\frac{1}{2}}x_2^{\frac{1}{4}}$

Exercise 5. For each of the following production functions, derive the technical rate of substitution (TRS) between x_1 and x_2 :

(a) $f(x_1, x_2) = 3x_1 + 2x_2$

(b) $f(x_1, x_2) = x_1^{\frac{1}{2}} + x_2^{\frac{1}{2}}$

(c) $f(x_1, x_2) = x_1x_2$

(d) $f(x_1, x_2) = x_1^{\frac{1}{2}}x_2^{\frac{1}{4}}$