TYPOS ALERT Chapter 1

Corrections in green are less serious and probably errors that you caught as you read through. Corrections in orange are more serious. Corrections in red are major blunders. If you see additional typos (or think you do) please email me ASAP.

Thanks,

John

Chapter 1

- Page 5: Last paragraph. “This chapter and the next take you through the mathematics which will be central to mastering the economics in the chapters that follow”

- Page 10: Third paragraph. ““If a function $f$ is strictly increasing, it is very tempting to conclude that the map of the function must have a strictly positive slope”

- Page 11: First equation. Should be superscript

$$\frac{f(x) - f(x^0)}{x - x^0} - \frac{df}{dx} (x^0) > -\varepsilon = -\frac{1}{2} \frac{df}{dx} (x^0)$$

- Page 12: Third equation, just above the graph.

$$\frac{df}{dx} (x^0) \leq 0, \text{ with equality if } x^0 > 0$$

- Page 13: Third paragraph. “Thus the approximating function has the same second derivative at $x^0$ if $\alpha_2 = \frac{1}{2} \frac{d^2 f}{dx^2} (x^0)$”

- Page 16: First line should be “…where $g$ takes on its maximum. If $g(\tilde{x}) < 0$ then there must be some point $c \in (a, b)$ where $g$ takes on its minimum”

- Page 19: Exercise 1.2-3(b) “If this condition is satisfied how much will the subject invest?”

- Page 19: Exercise (1.2-4) “$f(x^0) + \lambda (x^1 - x^0) - f(x^0) - \lambda \frac{df}{dx} (x^0)(x^1 - x^0) - a\lambda^2$”

- Page 21: Second paragraph. should be “A function with a non-increasing slope is said to be concave…”

- Page 24: Last equation. should be “$f(x^0) - \lambda f(x^1) + (1-\lambda) f(x^0), \ 0 \leq \lambda \leq 1$” (Same typo in Concave function definition (D0) in page 25)
• Page 25: Sufficient condition definition, last equation. “\( f(x) \leq f(x^0) \)” should be “\( f(x) < f(x^0) \)”

• Page 26: In Quasi-concavity and Sufficient Conditions for a Maximum. “\( f(x^0) = 0 \)” should be “\( \frac{df}{dx}(x^0) = 0 \)”

• Page 27: Exercise 1.3-2 (b) should be “Show that this function is convex with respect to the factor L.”

• Page 27: Exercise 1.3-3 (b). “An increasing concave function of a concave function is concave”

• Page 30: End of first paragraph should be “In the two variable case the map of the function is a surface in 3-dimensional space \( \mathbb{R}^3 \).”

• Page 32: Second paragraph. should be “We will derive the second Proposition”

• Page 32:

\[ q(x) = a_1(x_1 + \frac{a_{12}x_2}{a_{11}})^2 + \frac{1}{a_{11}}(a_{11}a_{22} - a_{12}a_{21})x_2^2 \]

The same change should be applied to equation (1.4-3).

• Page 33: Third paragraph. “…Differentiating by \( x_i \)” should be “…Differentiating by \( x_j \)”

• Page 34. The equation just above the graph. “\( g(\lambda) = f(x^2) = f(x^0 + \lambda(x^1 - x^0) \)” should be “\( g(\lambda) = f(x^2) = f(x^0 + \lambda(x^1 - x^0)) \)”

• Page 36: Last equation. “\( \frac{dx_2}{dx_1} = \frac{df}{dx_1} = \frac{\frac{\partial f}{\partial x_1}}{\frac{\partial f}{\partial x_2}} \)” should be “\( \frac{dx_2}{dx_1} = \frac{df}{dx_1} = -\frac{\frac{\partial g}{\partial x_1}}{\frac{\partial g}{\partial x_2}} \)”

• Page 36: Last paragraph. “\( b = 36 \)” should be “\( b = 33 \)”

• Page 37: “\( \frac{dx_2}{dx_1} = -\frac{\frac{\partial f}{\partial x_1}}{ \frac{\partial f}{\partial x_2} } = \frac{4x_1 + 4x_1^3}{1 + 3x_2^2} \)” should be “\( \frac{dx_2}{dx_1} = -\frac{\frac{\partial g}{\partial x_1}}{\frac{\partial g}{\partial x_2}} = \frac{4x_1 + 4x_1^3}{1 + 3x_2^2} \)”
Page 37. In Implicit Function Theorem, the condition \( \frac{\partial g}{\partial x_1}(x^0) \neq 0 \) should be \( \frac{\partial g}{\partial x_2}(x^0) \neq 0 \)\.

Page 39: Exercise 1.4-1. “Use a spread-sheet to depict the 2-dimensional budget plane of an individual with an income of 200 purchasing commodity vector \( (x_1, x_2, x_3) \) at prices \( p = (1, 6, 5) \)” should be “Use a spread-sheet to depict the 2-dimensional budget plane of an individual with an income of 600 purchasing commodity vector \( (x_1, x_2, x_3) \) at prices \( p = (4, 2, 5) \).”