
A Primer on the Calculus of Variations and Optimal Control Theory: Errata

Mesterton-Gibbons, STML 50
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Page 50, Exercise 6.4: The lower integration limit is “ a ,” not “0”

Page 52, line below (7.10): Replace “ $k = \eta'(x)$ ” by “ $k = \epsilon\eta'(x)$ ”

Page 53, first line of (7.11): Replace “ $\eta'(x)$ ” by “ $\epsilon\eta'(x)$ ”

Page 56, first display: Replace

$$\frac{1}{2} \left\{ -\frac{\pi^2 K_1}{\delta^2} \cdot 1^2 + K_2 \cdot 1^4 \right\} \{c + \delta - (c - \delta)\} = -\frac{\pi^2 K_1}{\delta} + \delta K_2,$$

by

$$\frac{1}{2} \int_{c-\delta}^{c+\delta} \left\{ -\frac{\pi^2 K_1}{\delta^2} \sin^2 \left(\frac{2\pi\{x-c\}}{\delta} \right) + K_2 \cdot 1^4 \right\} dx = -\frac{\pi^2 K_1}{2\delta} + \delta K_2,$$

Page 61, second line of (8.22): Replace “ k ” by “ \sqrt{k} ”

Page 81, two lines below (11.1): Replace “case.” by “case; and so here we regard an extremal as admissible if, in lieu of (2.2), it satisfies appropriate endpoint conditions that we are about to determine.”

Page 83, (11.13): Replace “ $y_x(x, \epsilon)$ ” by “ $y_x(x, \epsilon)$ ”

Page 87, (11.35): Replace “ $|k|$ ” by “ k ”

Page 87, line below (11.35): Replace “ k ” by “ $k (> 0)$ ”

Page 90, Exercise 11.4: Replace “ $xy'^2 + \sqrt{xy}$ ” by “ $xy'^2 + \sqrt{xy}$ ”

Page 99, last sentence of lecture: Replace “Henceforward” by “In Lectures 13 and 14”

Page 102: Delete “{” from the first integral

Page 104, Figure 13.1: Replace “ Γ_0 ” by “ Γ_* ”

Page 112, second line: Replace “ $(1, 0)$ ” by “ $(0, 1)$ ”

Page 137, (17.12): Replace “ $\delta x_i(t) + o(\delta t)$ ” by “ $\delta x_i(t_1) + o(\delta t)$ ”

Page 141, line below (17.27): Replace “tranfers” by “transfers”

Page 148, first line: Replace “ $x_3(0) = 0$ ” by “ $x_3(t_0) = 0$ ”

Page 161: Replace (19.15) by

$$\begin{aligned} \ddot{\sigma} &= e^{-\delta x_2} (\{1 - 4x_1 - \delta + \theta\} \dot{x}_1 - \delta \{x_1(1 - 2x_1 + \theta) - \delta(x_1 - \theta)\}) \\ &= e^{-\delta x_2} \{1 - 4x_1 - \delta + \theta\} \dot{x}_1 = -e^{-\delta x_2} \left(2x_1 + \frac{\delta \theta}{x_1} \right) \dot{x}_1 \\ &= x_1 e^{-\delta x_2} \left(2x_1 + \frac{\delta \theta}{x_1} \right) (qu - 1 + x_1) \end{aligned}$$

Page 162, Exercise 19.1: Replace “(with t_1 unspecified)” by “for suitable t_1 ”

Page 174, (21.20), lower integration limit: Replace “0” by “ t_0 ”

Page 175, (21.22): Replace “ $x(t_1)$ ” by “ $x_0(t_1)$ ”

Page 177, footnote, line 8: Replace “ $\lambda_0 + K \sin(\theta) + u^* \tan(\theta)$ ” by “ $\lambda_0 + K \{\sin(\theta) + u^* \tan(\theta)\}$ ”

Page 177, footnote, line 9: Replace “ $\lambda_0 + K \sin(\theta) \pm \tan(\theta)$ ” by “ $\lambda_0 + K \{\sin(\theta) \pm \tan(\theta)\}$ ”

Page 178, (21.38): Replace “ $\lambda_2(t_1)$ ” by “ $\lambda_1(t_1)$ ” in denominator

Page 226, Exercise 4.5, end of 4th line: Replace “ \pm ” by “ $= \pm$ ”

Page 227, Exercise 6.4: Replace " \leq " by " $>$ "

Page 229, Exercise 10.6: Delete this line

Page 239, Exercise 21.4, second line: Interchange (a) and (b)