Chapter 1.

• p. 2, in definition of a *proper function*: specify the domain is not empty.
• p. 4, Figure 1.1 Caption: function is from Chapter 7 not Chapter 6.
• p. 4, Theorem 1.2.2 last part of (c) should say: in *infinite* dimensions lower-semicontinuity is not automatic.
• p. 8, definition of distance function the inf should be over $s \in S$: $\inf_{s \in S} \|x - s\|
• p. 9, Example 1.3.6: (c) $\log f$ is a convex function.
• p. 9, line −17: $\beta(x, y) = \Gamma(x)\Gamma(y)/\Gamma(x + y)$
• p. 10, Example 1.39 should say suppose $g$ is concave (which implies $\log g$ is concave)

Chapter 2.

• p. 21, line 2: whose epigraph is the closure of the *epigraph* of $f$
• p. 21: *Convex combinations* should have been introduced with convex hulls and the basic characterization of convex hulls using convex combinations should have been given in Section 2.1. Details are available at 
  
  [http://faculty.lasierra.edu/~jvanderw/ConvexFunctions/Notes/convcomb.pdf](http://faculty.lasierra.edu/~jvanderw/ConvexFunctions/Notes/convcomb.pdf)
• p. 27, Proof of Fact 2.1.16: $f(t\bar{x} + d)$ should be $f(\bar{x} + td)$
• p. 32, Hint for Exercise 2.1.24: $x \log(n) \leq (n + 1 + x) - g(n + 1) \leq x \log(n + 1)$ should be $x \log(n) \leq g(n + 1 + x) - g(n + 1) \leq x \log(n + 1 + x)$. And right-most side of first displayed inequality should be $x \log (1 + \frac{1}{n})$ in place of $\log (1 + \frac{1}{n})$
• p. 35, further details for the argument suggested in the second last sentence of the proof of Theorem 2.2.1 can be found at 
  
  [http://faculty.lasierra.edu/~jvanderw/ConvexFunctions/Notes/Thm221.pdf](http://faculty.lasierra.edu/~jvanderw/ConvexFunctions/Notes/Thm221.pdf)
• p. 42, Exercise 2.2.14: Rado’s result: “$k(A_k - G_k) \geq (k - 1)(A_{k-1} - G_{k-1})$” should be replaced by “$k(A_k - G_k) \geq (k - 1)(A_{k-1} - G_{k-1})$”
• p. 47, line −7: $p \geq d$ (should match theorem statement)
• p. 51, line 17: $\inf_{x \in E} \{\ (\text{the ‘‘’ is missing}
• p. 52, Exercise 2.3.14(f): note the convex function $f : E \to \mathbb{R}$ is automatically continuous by Theorem 2.1.12
• p. 53, 2.3.15(c): $f : E \to \mathbb{R}$ (just for consistency, though valid in any normed space $X$)
• p. 53, 2.3.17(a): $f : E \to (-\infty, +\infty]$ (just for consistency, though valid on any normed space $X$)
• p. 54, line −6: should be \( \frac{1}{2}d^2 \) on left-hand side in displayed equation

• p. 55, Theorem 2.3.7: The definition of \( h \) in the hint should be \( h(x) := \inf_{R} \ldots \)

• p. 56, Exercise 2.2.23: Replace \( \phi_0 \) with \( \phi_1 \) in first constraint: \( \int_{T} \phi_1(x(t), t) \mu(dt) = b_1 \)

• p. 58, Exercise 2.3.27, in the definition of the polar function replace \( (kC)^\circ(x) := \) with \( k\circ_C(x^*) := \)

• p. 60, Exercise 2.3.28(d): missing period at end of statement.

• p. 60, Exercise 2.3.29, the definition of \( Df \) should be: \( f(x) − f(y) − \langle f'(y), x − y \rangle \)

• p. 65, \( \phi \neq 0 \) in Corollary 2.4.3.

• p. 66, Thm 2.4.6: Suppose \( \dim E > 0 \)

• p. 67, Thm 2.4.7: Note a stronger result is available, namely the separation holds if and only if \( riC_1 \cap riC_2 = \emptyset \). See Theorem 11.3 in Rockafellar’s book *Convex Analysis* for this.

• p. 69, line 9: should be \( \alpha(x) := \langle A^*\phi, x \rangle + r \)

• p. 70: in (2.4.12): \( \sum_{i=0}^{m} \lambda_i x_i \) (first sum should also be from \( i = 0 \) to \( i = m \)).

• p. 70: \( i \) is missing in (2.4.13): for \( i = 0, 1, 2, \ldots, m, x \in E \).

• p. 81, Hint to Exercise 2.5.2: \( G_{n,m} := \left\{ x \in U : \sup_{\|h\| \leq \frac{1}{m}} f(x + h) + f(x - h) - 2f(x) < \frac{1}{mn} \right\} \)

• p. 82, line −6: See [95, Chapter 6] for a

• Section 2.6: functions are tacitly assumed closed, e.g. Proposition 2.6.3

• p. 84, line −3: as \( t \to 0^+ \)?

• p. 85, line −11: \( h \in W \) (not \( w \in W \))

• p. 85, Proposition 2.6.3: the function \( \Delta^2 f(x) \) is closed nonnegative and convex

• p. 86, Theorem 2.6.4: *equivalently, generalized* should be *equivalently, generalized*

• p. 88, line −4, Exercise 2.6.4(c) should read: \( \lim_{t \to 0} \frac{\phi_t - \nabla f(x)}{t} = Ah \) where \( \phi \in \partial f(x + th) \).

• p. 91, Hint to 2.6.13, second last line should read: there is a continuous strictly increasing function \( g \) such that \( g'(t) = \infty \) for all \( t \in G \)

Chapter 3.

• p. 99, the third line of Section 3.2: \( \text{Diag} : \mathbb{R}^n \)

• p. 118, line 3 of proof of Theorem 3.5.3: should refer to Exercise 3.5.12

• p. 121, Exercise 3.5.7, the first line of Hint: \( f(x) − f(x_0) + \epsilon \)
Chapter 4.

- p. 131, Proposition 4.1.9, last line: \( \bar{x} \in \text{cont } f \)
- p. 132, Corollary 4.1.12: \( C \subset X \ldots \phi \in X^* \) (note automatically \( \phi \neq 0 \))
- p. 133, Remark 4.1.16(b): \( \phi(x) = 1 \);
- p. 136, Corollary 4.1.20: note (automatically) \( \phi \neq 0 \)
- p. 136, Theorem 4.1.22: note (automatically) \( x_0 \neq 0 \)
- p. 133, in the sandwich theorem: \( f \) and \( g \) can be extended real-valued functions
- p. 134, line −10: \( + \frac{1}{2}S^+ \) (\( S \) is missing)
- p. 135, line 7: definitions of \( a \) and \( b \) should be interchanged
- p. 135, line −3: should be \( g(Tx) \) not \( g(Ax) \).
- p. 136, Proposition 4.1.23, line −3: one need only assume \( x_0^* \in \text{dom } f \), and on p. 137, line 5, it suffices to have \( x_0^* \in \text{dom } f \).
- p. 137, line 7: \( \langle x_0, x_0^* - \alpha \rangle \) should be \( \langle x_0, x_0^* \rangle - \alpha \)
- p. 138,: In Hint for 4.1.2(b)(ii) “\( f(x) = 0 \) for all \( x \) in a dense convex subset ...” should be replaced with something like “\( f(x) = \Lambda(x) \)” for all \( x \) in a dense convex subset of \( B_X \) where \( \Lambda \) is an appropriately chosen discontinuous linear functional ...”
- p. 142, Exercise 4.1.21(a): \( \Lambda : c_0 \to \mathbb{R} \) (\( \Lambda \) will be extended to \( c_0 \) in (b))
- p. 146, Exercise 4.1.46(c): \( f^*(x) = \|x\|^2/2 \) if \( x \in \text{conv } F \) and \( f^*(x) = +\infty \) otherwise.
- p. 151, line 15: norm dense in \( S_X \)
- p. 154, Cor. 4.2.12: \( U \) is an open convex set
- p. 157, proof of Proposition 4.2.16: there are subtleties in the directional modification of the proof of Proposition 4.2.14 when \( f \) is not Lipschitz. Full details of the proof of Proposition 4.2.16 are at
  http://faculty.lasierra.edu/~jvanderw/ConvexFunctions/Notes/Prop4216.pdf
- p. 160, line −2: strict for distinct \( x, y \in U \).
- p. 167, line 3: Then there is
- p. 168, Hint to Exercise 4.3.6: specify \( x_0 \in \text{bnd } C \).
- p. 171, Proposition 4.4.1(c) should read: If \( f \leq g \), then \( f^* \geq g^* \).
- p. 172, Proposition 4.4.2(a) should include assumption \( f \) is lsc at some point of its domain (to apply epi-separation theorem)
- p. 173, 2nd line of proof of Fact 4.4.4: \( \{u \in X^{**} : f^{**}(u) \leq K\} \) (capital \( K \))
- p. 188, Fact 4.5.3, In particular statement specify nonempty: every nonempty closed convex
• p. 190, Theorem 4.5.7(c) should read: $d^2_C$ is Gâteaux differentiable and $C$ is proximal. For some further information related to distance functions and differentiability see http://faculty.lasierra.edu/~jvanderw/ConvexFunctions/Notes/distancefun.pdf

• p. 191, Exercise 4.5.4 should additionally assume: $A$ is proximal

• p. 193, Exercise 4.5.9: in definition of approximately convex the ball $D$ must be disjoint from $C$

• p. 194, Exercise 4.5.10, definition of a sun: “for $x \in S$” should be “for any $x$ in the Hilbert space”

• p. 202, Theorem 4.6.13: If $\nabla^2 f(\bar{x})(h,h) > 0$ for all $\bar{x} \in U$, $h \in S_X$, then $f$ is strictly convex.

• p. 204, Remark 4.6.17(d): mention that $C$ has empty interior

• p. 205, Exercise 4.6.4(b): end question with “?”

• p. 205, Exercise 4.6.6, specify $x \neq y$ in definition of strictly convex norm: whenever $\|x\| = \|y\|$ and $x \neq y$

Chapter 5.

• tacitly uses $\delta(\cdot)$ or $\delta_{\|\cdot\|}(\cdot)$ in place of $\delta_X(\cdot)$.

• p. 217, line −2: for every

• p. 221, last line of proof of Theorem 5.1.32 should read: of weaker results (delete ‘a’)

• p. 236, Hint to Exercise 5.2.6(b): $f^*(ne_n) - \langle 0, ne_n \rangle = \frac{n}{2^n}$

• p. 236, second line of Hint to Exercise 5.2.6: now implies $(f - \phi)(u) \geq (f - \phi)(x) + n\delta$ (should not be $>$)

• p. 241: It is worth noting that each condition in Theorem 5.3.7(b) is equivalent to $f^*$ being strongly rotund as introduced in Section 6.4. For details see http://faculty.lasierra.edu/~jvanderw/ConvexFunctions/Notes/Thm537.pdf

• p. 244: $\delta_f : [0, \infty) \to [0, \infty]$

Chapter 6.

• p. 276, line −7: replace $T(S) = \bigcup_{x \in A} T(x)$ with $T(S) = \bigcup_{x \in S} T(x)$

• p. 279, last line of proof of Theorem 6.1.5 should read: $\ldots v_0 \in \partial f(x_0)$ as desired.

• p. 280 Thm 6.1.7 and its proof $T_U$ should be $T|_U$

• p. 283, Exercise 6.1.8 should say Hint and not Proof.
Chapter 7.

- p. 339: Lemma 7.2.2: $x \in \text{bndy dom } \partial f$
- p. 340, first line: $x \in \text{bndy dom } \partial f$
- p. 347, Third line of Hint to Exercise 7.3.3(b): should be Lemma 7.3.1(a) not 7.3.1(i)
- p. 348, Exercise 7.3.7: extra )
- p. 351: Theorem 7.4.4 parenthetical statement should read: where we note $(A-x)^{o}$ is equal to the negative polar cone $(A-x)^{-}$

Chapter 9.

- p. 404, note $f$ need not be closed and convex
- p. 404, second paragraph: the subdifferential of a proper convex lsc function on a Banach space is the typical . . .
- p. 406, Corollary 9.1.5: $f$ and $g$ need to also be lsc
- p. 436, last line: $\langle y_{n}^{*}, y_{n} \rangle = -\langle j_{n}^{*}, y_{n} \rangle$
- p. 451: Theorem 9.7.2 should be for $x \in X$ or $\hat{x} \in X^{**}$.
- p. 451, proof of Theorem 9.7.2, line 6: right parenthesis should be before $\leq: \max(...)$ $\leq 0$
- p. 454: Exercise 9.7.9(d): . . . of the Hamel basis to $F$.

Chapter 10.

- p. 460: 4th line of 10.1.1 a real-valued convex functions
- p. 477, line 9: in various forms for were given

Index.

- p. 512, line –18, left column: characterization

Acknowledgments. We are grateful to Professor Ernő Robert Csetnek for kindly informing us of several of the infelicites that have been listed here.