

Errata to Instructor's Solution Manual to S. J. Colley, *Vector Calculus*, 2nd ed.

January 27, 2005

- p. 20, line -6. Replace $3(-2) + (-9) = -15$ with $3(2) + (-9) = -3$.
- p. 29, line -3. Replace " $\sqrt{31/34}$ " with " $31/\sqrt{34}$ ".
- p. 51, Exercise 39 (b). In view of the sign error in \mathbf{e}_φ in formulas (9) on page 75 of the text, several signs must be changed.
- p. 71, Exercise 7. Replace "Range $\mathbf{f} = \{(x, y, z) \mid y \neq 0, z \geq 0\}$ " with "Range $\mathbf{f} = \{(x, y, z) \mid y \neq 0, y^2 z = (xy - y - 1)^2 + (y + 1)^2\}$ ".
- p. 88, line -2. Replace " $\|(x, y)\| < \delta$ " with " $0 < \|(x, y)\| < \delta$ ".
- p. 92, line -2. Replace "is continuous" with "is differentiable".
- pp. 95-96, Solution to Exercise 44. The function is differentiable, so $z = 0$ is the tangent plane. The calculations and graph are correct in parts (a) and (b). However, for part (c), if we let $(x, y) \neq (1, 0)$, then, since $f(1, 0) = 0$ and $\nabla f(1, 0) = \mathbf{0}$, we have
- $$0 \leq \frac{|f(x, y) - f(1, 0) - \nabla f(1, 0) \cdot (x - 1, y - 0)|}{\|(x, y) - (1, 0)\|} = \frac{|f(x, y)|}{\sqrt{(x - 1)^2 + y^2}}.$$
- Now $|f(x, y)| = |x - 1|^{2/3}|y|^{2/3} \leq ((x - 1)^2 + y^2)^{1/3} ((x - 1)^2 + y^2)^{1/3} = ((x - 1)^2 + y^2)^{2/3}$. Thus
- $$\frac{|f(x, y)|}{\sqrt{(x - 1)^2 + y^2}} \leq \frac{((x - 1)^2 + y^2)^{2/3}}{((x - 1)^2 + y^2)^{1/2}} = ((x - 1)^2 + y^2)^{1/6}.$$
- Since this last expression approaches 0 as $(x, y) \rightarrow (1, 0)$, we see that f must be differentiable by Definition 3.4.
- p. 166, Exercise 27. In the first display, replace the equation for \mathbf{e}_φ with $\mathbf{e}_\varphi = \cos \varphi \cos \theta \mathbf{i} + \cos \varphi \sin \theta \mathbf{j} - \sin \varphi \mathbf{k}$. Also, in line 3 of the solution, replace "cylindrical" with "spherical".
- p. 167, line 3. The final result should be $\frac{\partial f}{\partial \rho} \mathbf{e}_\rho + \frac{1}{\rho} \frac{\partial f}{\partial \varphi} \mathbf{e}_\varphi + \frac{1}{\rho \sin \varphi} \frac{\partial f}{\partial \theta} \mathbf{e}_\theta$.
- p. 195, last line of Exercise 44 (a). Replace "arguement" with "argument".
- p. 271, line -10. Replace $\int_0^1 4 dt = 4$ with $\int_0^1 -4 dt = -4$.
- p. 271, line -8. Replace $\int_{-1}^1 2 dy = 4$ with $\int_{-1}^1 -2 dy = -4$ at the end of the line.
- p. 283, Exercise 13. The solution should note that the straight portions of ∂D determined by the lines $\theta = a$ and $\theta = b$ do not contribute to the line integral.