Errata for *Integrated Physics and Calculus*, Volume I

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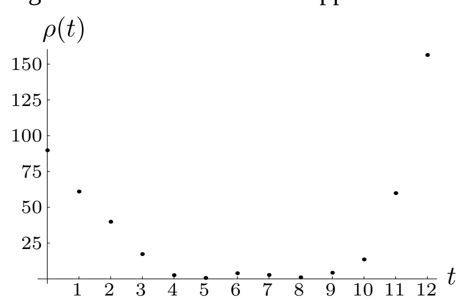
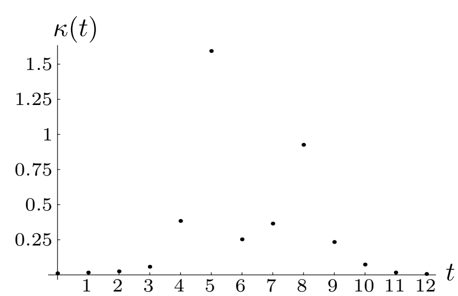
Note: "Line $-n$" means the nth line from the bottom of the page.

p. 5, line 3	as vector $\rightarrow$ as a vector
p. 16, Table 1.3	$\vec{a} \cdot (\vec{b} + \vec{c}) = \vec{a} \cdot \vec{b} + \vec{a} \cdot \vec{b} \quad \rightarrow \quad \vec{a} \cdot (\vec{b} + \vec{c}) = \vec{a} \cdot \vec{b} + \vec{a} \cdot \vec{c}$
p. 33, line 14	dimensions of volume $\rightarrow$ dimensions of density
p. 41, Problems 12/13	for position function $\rightarrow$ for the position function
p. 69, line -6	$\dfrac{\cos x \dfrac{d}{dx}[x^3] - \dfrac{d}{dx}[\cos x]x^3}{(x^3)^2} = \dfrac{\cos x(3x^2) - (-\sin x)(x^3)}{x^6} = \dfrac{3\cos x + x \sin x}{x^4} \quad \rightarrow$ $\dfrac{\dfrac{d}{dx}[\cos x]x^3 - \cos x \dfrac{d}{dx}[x^3]}{(x^3)^2} = \dfrac{(-\sin x)(x^3) - \cos x(3x^2)}{x^6} = -\dfrac{x \sin x + 3\cos x}{x^4}$
p. 73, Figure 2.21	$t \quad \rightarrow \quad x$
p. 73, Figure 2.21 caption	$f(t) \quad \rightarrow \quad f(x) \quad , \quad f(t_1) \quad \rightarrow \quad f(x_1)$
p. 83, line 8	$\dfrac{d}{dt}\left[\dfrac{\vec{r}(t)}{g(t)}\right] \quad \rightarrow \quad \dfrac{d}{dt}\left[\dfrac{\vec{r}(t)}{f(t)}\right]$
p. 99, line -2	$\int_a^b f(x)\,dx \lim_{n\to\infty} \sum_{i=1}^{n} f(x_i)\dfrac{b-a}{n} \quad \rightarrow \quad \int_a^b f(x)\,dx = \lim_{n\to\infty} \sum_{i=1}^{n} f(x_i)\dfrac{b-a}{n}$
p. 108, line 3	$\int 2xd\,x \quad \rightarrow \quad \int 2x\,dx$
p.112, line -1	$\int_a^t f(t)\,dt \quad \rightarrow \quad \int_a^x f(t)\,dt$
p. 128, line 6	antiderivatives $\rightarrow$ antiderivative
p. 128, Problem 6	$z'(t) = 1/z^2 \quad \rightarrow \quad z'(t) = 1/t^2$
p. 145, line -10	wand $\rightarrow$ want
p. 152-153, Figures 4.9 and 4.10	Figures 4.9 and 4.10 should appear as follows.





p. 162, Problem 9(a), line 3	corresponding to $u =$ $\rightarrow$ corresponding to $t =$
p. 163, Problem 9(a)	$\kappa(t) = \dfrac{\lvert f''(t)\rvert}{[1 + (f'(t))]^{3/2}} \quad \rightarrow \quad \kappa(t) = \dfrac{\lvert f''(t)\rvert}{\left[1 + (f'(t))^2\right]^{3/2}}$
p. 164, Problem 16, line 3	$t'(u)$ not equal to zero $\rightarrow$ $t'(u) > 0$
p. 170, line -6	Omit the sentence "The result, $\vec{F}_N = -\vec{F}_g$, can also be obtained . . . "

p. 176, Figure 5.9(b) labels	$m_1 \cos\theta \quad \to \quad m_1 g \cos\theta \qquad , \qquad m_1 \sin\theta \quad \to \quad m_1 g \sin\theta$
p. 195, Example 6.1, first sentence of solution	All derivatives appear to first-order, so the equation is first-order. $\to$ All derivatives appear to the first power, so the equation is linear.
p. 206, line -7	left side $\to$ right side
p. 213, line -15	unity $\to$ unit
p. 239, line 6	Chapter 5 $\to$ Chapter 6
p. 270, Problem 26	described in Problem 25 $\to$ described in Problem 25
p. 285, line -9	acceleration component v_x $\to$ acceleration component a_x
p. 285, line -5	$\approx \quad \to \quad =$
p. 287, Theorem 8.4	Theorem 8.4 should read

Theorem 8.4. *Let f be a function that is twice differentiable for all x in $[a,b]$. If K is a positive number such that $-K \le f''(x) \le K$ for all x in $[a,b]$, then*

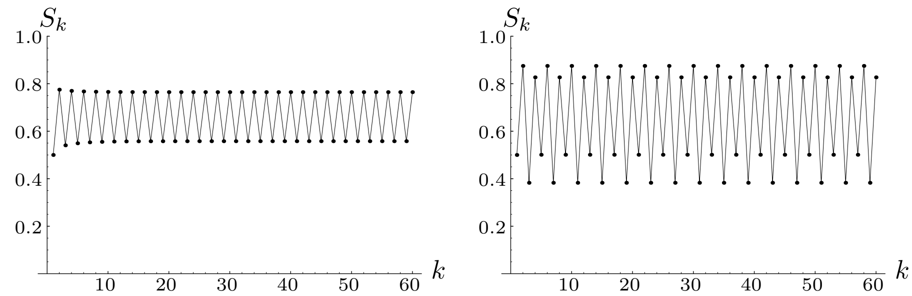
$$f(a)+\frac{f(b)-f(a)}{b-a}(x-a)-\frac{K(x-a)(b-x)}{2} \le f(x) \le f(a)+\frac{f(b)-f(a)}{b-a}(x-a)+\frac{K(x-a)(b-x)}{2} \tag{8.13}$$

for all x in $[a,b]$.

p. 287, line 8	With K equal to the maximum of $\lvert m\rvert$ and $\lvert M\rvert$, $\to$ Rearranging and using absolute values,
p. 296, line 5	$f(x_1) \quad \to \quad f(x_i)$
p. 297, line -7	$\displaystyle\int_{x_{i-1}}^{x_i} K_i(x-x_{i-1})(x_i-x)\,dx \quad \to \quad \int_{x_{i-1}}^{x_i} \frac{1}{2}K_i(x-x_{i-1})(x_i-x)\,dx$
p. 297, line -4	$\displaystyle\int_{x_{i-1}}^{x_i} K_i(x-x_{i-1})(x_i-x)\,dx \quad \to \quad \int_{x_{i-1}}^{x_i} \frac{1}{2}K_i(x-x_{i-1})(x_i-x)\,dx$
p. 323, Figure 9.12(b)	$v_1 \quad \to \quad u_1 \qquad , \qquad v_2 \quad \to \quad u_2$
p. 324, line 5	$0 = mvu_1 \cos\frac{\pi}{6} - mu_2\cos\alpha \quad \to \quad 0 = mu_1 \sin\frac{\pi}{6} - mu_2 \sin\alpha$
p. 324, line 17	$\vec{v}_0 = v\vec{u}_1 + \vec{u}_2 \quad \to \quad \vec{v}_0 = \vec{u}_1 + \vec{u}_2$
p. 373, line -8	makes and angle $\to$ makes an angle
p. 379, last paragraph, continuing on p. 381	The paragraph should read as follows:

A little experimentation reveals that this model has a wide variety of behavior depending on the choice of the parameter β. Some examples are shown in Figure 11.3 for the values $\beta = 2.4, 2.8, 3.1, 3.5,$ and 3.9. For $\beta = 2.4$ [Figure 11.3(b)], we see successive elements in the sequence increasing to a limiting value of about 0.58. This behavior is similar to that of the case with $\beta = 1.1$, except the values increase to the limit rather than decrease. For $\beta = 2.8$ [Figure 11.3(c)], the sequence again tends to a single limit value but in quite a different manner with successive values oscillating between being greater than and less than the apparent limit value of about 0.64. A different behavior altogether appears with $\beta = 3.1$, as seen in Figure 11.3(d). In this case, the sequence does not appear to converge to a single limit value but rather settles down to oscillating between two distinct values at approximately 0.56 and 0.77. A close look at the $\beta = 3.5$ case in Figure 11.3(e) reveals similar oscillatory behavior but now with one cycle including *four* distinct values. Finally, in the $\beta = 3.9$ case [Figure 11.3(f)], no regular pattern is evident.

p. 380, Figure 11.3 — Figures 11.3 (d) and 11.3 (e) should appear as follows.



(d) $\beta = 3.1$ (e) $\beta = 3.5$

p. 383, line 2 of Section 11.2.1 — $\mathbb{N} = \{0, 1, 2, 3, \ldots\} \quad \to \quad \mathbb{N} = \{1, 2, 3, \ldots\}$

p. 392, line 10 — $1/(1-p) \quad \to \quad 1/(p-1)$

p. 404, line 3 — $\sum_{k=0}^{15} \frac{1}{k!} x^k \quad \to \quad \sum_{k=0}^{15} \frac{1}{k!} 3^k$

p. 404, Table 11.7 — $\ln(1+x) = \sum_{k=1}^{\infty} \frac{(-1)^k}{k} x^k \quad \to \quad \ln(1+x) = \sum_{k=1}^{\infty} \frac{(-1)^{k+1}}{k} x^k$

p. 447, line -4 — lines in the plane by linear equations in three variables $\to$ lines in the plane by linear equations in two variables

p. 450, line 1 — line $\to$ plane

p. 450, line -4 — in two places: $-D/A \quad \to \quad -D/C$

p. 456, line 9-10 — a infinite number of values for $\arcsin 0.5$ $\to$ infinitely many values of $\arcsin 0.5$

p. 461, line -8 — desribes $\to$ describes

p. 463, line 4 — The text following the first display should read:
Fix the parameters a, b, and c while considering d as varying from 1 to -1. Think of the corresponding surfaces in animation with d serving as the time (running backward from $d = 1$ to $d = -1$). At $d = 1$, we see a one-sheet hyperboloid. As d decreases, the neck of the one-sheet hyperboloid contracts in toward the origin. For $d = 0$, the neck pinches down to the origin itself and the surface is an elliptic cone. As d continues to decrease (and is now negative), the surface splits into a two-sheet hyperboloid.

p. 468, line -8 — $\lim_{u \to K} \cos(u) = K \quad \to \quad \lim_{u \to K} \cos(u) = \cos(K)$

p. 487, first display — Should read:

$$\tilde{f}(x,y) = \begin{cases} f(x,y) & \text{if } (x,y) \text{ is in } R \\ 0 & \text{if } (x,y) \text{ is in } \tilde{R} \text{ but not in } R. \end{cases}$$

p. 498, line -12 — The third coordinate is z is the same $\to$ The third coordinate is the same

p. 502, line 6 — by integrating the the function $\to$ by integrating the function

p. AN-1, Volume 1, Section 1.1, Problem 7 — $\langle -8, 4 \rangle \quad \to \quad \langle -8, -4 \rangle$

p. AN-1, Volume 1, Section 1.4, Problem 17	kg $\rightarrow$ kg/m^3
p. AN-1, Volume 1, Section 2.2, Problem 19	66.6 km/h $\rightarrow$ 66 km/h
p. AN-2, Volume 1, Section 3.1, Problem 13	$L_5 = -24.72, U_5 = -22.92 \quad \rightarrow \quad L_5 = -25.32, U_5 = -22.344$
p. AN-3, Volume 1, Section 4.1, Problem 7(a)	$\vec{v} = \langle 1.5t, -\frac{1}{2}t^2 \rangle \quad \rightarrow \quad \vec{v} = \langle 0, -\frac{1}{2}t^2, 1.5t \rangle$
p. AN-3, Volume 1, Section 4.1, Problem 7(b)	$\vec{r} = \langle 0.75t^2 + 30, -\frac{1}{6}t^3 + 22 \rangle \quad \rightarrow \quad \vec{r} = \langle -12, -\frac{1}{6}t^3 + 22, 0.75t^2 + 30 \rangle$
p. AN-3, Volume 1, Section 4.1, Problem 15(b)	39.1 s $\rightarrow$ 55.3 s
p. AN-3, Volume 1, Section 4.3, Problem 4	$1 + \cos^2 t \quad \rightarrow \quad 1 + \sin^2 t$
p. AN-3, Volume 1, Section 5.2, Problem 11(b)	25.9 N $\rightarrow$ 26.4 N
p. AN-4, Volume 1, Section 7.1, Problem 11	$2mg/k \quad \rightarrow \quad mg/k$
p. AN-4, Volume 1, Section 7.3, Problem 3	$-32/2$ J $\rightarrow$ $-32/3$ J
p. AN-4, Volume 1, Section 8.1, Problem 3	$\frac{5}{23}\ln(x^2+3) + C \quad \rightarrow \quad \frac{5}{2}\ln(x^2+3) + C$
p. AN-4, Volume 1, Section 8.1, Problem 25	$x^2 \sin x + 2x \cos x + \sin x + C \quad \rightarrow \quad x^2 \sin x + 2x \cos x - 2 \sin x + C$
p. AN-5, Volume 1, Section 8.4, Problem 1(a)	$2.56 \pm 8 \quad \rightarrow \quad 2.56 \pm 4.8$
p. AN-5, Volume 1, Section 10.1, Problem 11	$\theta = e^t - 2 - 1 \quad \rightarrow \quad \theta = e^t - t - 1$
p. AN-5, Volume 1, Section 10.4, Problem 3	2.61 s $\rightarrow$ 0.261 s
p. AN-5, Volume 1, Section 11.3, Problem 5	$5 \quad \rightarrow \quad 4$