An Introduction to Differential Equations: Order and Chaos

by Florin Diacu (First edition, 2000)

Corrections

page	position	corrected text	comment
inside cover	Integration table — right side of equations	"$\ln\|\cdot\|$"	not "$\ln(\cdot)$" (10 occurrences)
p.10	5th line from bottom	"$f(r) = 1/r$ for $r > 0$ and $f(0) = 0$"	
p.11	Problem 11, line 3	"inverse seventh power"	insert "inverse"
p.11	Problem 11, line 4	"inverse ninth power"	insert "inverse"
p.11	Problem 11, col. 2, top line	"fahn der vahls"	omit extra "s"
p.33	Step 5, line 1	"c into x in step 2"	not "u"
p.34	Step 5, line 1	"function x in step 2"	not "u"
p.39	Problem 10	"$t^2v - 3t^2$"	sign of exponent
p.39	Problem 16	"$(t+2)\theta + t^3$"	"t^3", not "$3t$"
p.48	2nd para., line 6	"10^1 kg/m^3"	insert "kg/m^3"
p.50	Problem 33, equation	"$P' = kP\left(\frac{P}{n_1} - 1\right)\left(1 - \frac{P}{n_2}\right) - N$"	insert "P"
p.50	Problem 34, lines 5–6	"amount of glucose present"	not "injected"
p.50	Problem 34, line 9	"a differential equation"	not "logistic"
p.50	Problem 36, line 2	"force per unit mass"	insert phrase
p.50	Problem 37, line 2	"forces per unit mass"	insert phrase
p.60	line 2 after Problem 20	"through 28, apply the"	delete phrase
p.60	Problem 26	"$x' = x^2\ln(t+1)$"	replace equation
p.79	Problem 28, line 1	"$[0, 0.5]$"	change interval
p.81	last line, equation	"$P' = kP\left(\frac{P}{n_1} - 1\right)\left(1 - \frac{P}{n_2}\right) - A\cos Bt$"	insert "P"
p.91	Problem 17, line 2	"$w'(e) = \frac{3}{\sqrt{e}}$"	denominator
p.91	Problem 20, line 2	"$y'(1) = 0$"	repeated (delete 1)
p.93	Step 3, line 1	"$r_1 = r_2 = -b/2$"	minus
p.100	Problem 20	"$x'' = -\frac{1}{2}(x')^2 + x'$"	replace equation
p.100	Problem 27	"$x'' = \frac{4}{t}x' - \frac{6}{t^2}x$"	replace equation
p.107	Line 5 from bottom	"variable source (as shown..."	not "resistor"
p.107	Line 2 from bottom	"an electromagnetic force..."	not "a resistance..."
p.107	Last line	"variance of the source at the..."	not "resistor"
p.108	Line 4	"$mx'' = F_{\text{weight}} + F_{\text{electromagnetic}}$"	not "resistance"
p.108	Line 6	"$F_{\text{electromagnetic}}$"	not "resistance"
p.108	Figure 3.3.1	"source"	not "resistor"
p.109	Lines 4–3 before Problems	"shows that the electromagnetic force"	delete, replace
p.109	Lines 3–2 before Problems	"so the bar is pushed"	delete "finally"
p.110	Problem 36, 1st equation	"$x'' = -\frac{k}{m}x' - \frac{2g}{L}x$"	minus
p.110	Problem 36, 2nd equation	"$x'' = -\frac{k}{m}x' - \frac{2g}{L}x + \frac{1}{10}\cos 8\pi t$"	minus

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p.121	Problem 28, line 7	"$m = 1$kg, $\nu = \frac{1}{5}$kg/sec, $k = 1$N/m, $a = 1$m, $\omega_0 = 1$Hz"	replace parameters
p.137	Applications, line 15	"$\nu = 0.1$kg/sec"	add units
p.137	Last paragraph, line 2	"$\nu = 0.1$kg/sec"	add units
p.137	Last paragraph, line 2	"cords with coef-"	delete "damping"
p.141	Problems, line 2 after (d)	"$t = 0.1$ (a,c) or $t = 0.05$ (b,d)"	
p.142	Problem 9, line 5	"Table 3.6.2"	not "3.4.2"
p.142	Problem 12, line 1	"$x(0) = x'(0) = 0.1$"	not "0"
p.142	Problem 13, line 1	"$x'' = -x' - x$"	replace equation
p.142	Problem 14, line 1	"$x'' = x' - x\,, \quad x(0) = x'(0) = 1$"	delete π's, change IC
p.142	Problem 15, line 1	"$x'' = -x' - x$"	replace equation
p.142	Problem 16, line 1	"$x'' = \frac{1}{t}x' - \frac{x}{t}$,"	minus (note comma)
p.142	Problem 17, line 1	"$x'' = -\frac{e^{-t}}{t-2}x' - \frac{4t^2}{t^2-4}x + 2(1-t)$"	replace equation
p.142	Problem 18, line 1	"$x'' = \frac{1}{1-t}x' - \frac{x}{1-t}$,"	replace (note comma)
p.142	Problem 18, line 2	"$[2, 10]$"	not "$[2, 100]$"
p.146	program,lines 13,14	"t=t+h: M:=(M,[t,x]):"	reverse order
p.155	Problem 15	"$x'' = x' + x + \cos t$"	replace equation
p.156	Problem 21	"$x'' = \frac{1}{4}x' + x + t$"	numerator
p.156	Problem 22	"$x'' = -\frac{1}{3}x' - x - t$"	minus
p.156	Problem 27	"$x'' = tx' + 2x$"	denominator
p.156	Problem 35, line 2	"$[1, 2.5]$"	not "$[1, 4]$"
p.169	Problem 30, line 1	"Example 9"	not "8"
p.169	Problem 30, lines 2,3,5	$\mathbf{u}_1$, $\mathbf{u}_2$, $\mathbf{u}_3$	not $\mathbf{x}_1$, $\mathbf{x}_2$, $\mathbf{x}_3$
p.173	Proof, line 6	"$\phi(t) = c_1\mathbf{u} + c_2\mathbf{v} + c_3\mathbf{w}$"	not "$\varphi(t)$"
p.173	Proof, line 6	"solution of (7)"	not "(5)"
p.173	Proof, 3rd last line	"solution of (7)"	not "(5)"
p.187	Problem 18, line 8	"$(\mathbf{a}\sin\beta t + \mathbf{b}\cos\beta t)e^{\alpha t}$"	2nd expression
p.193	line 4	"**(d)** $a = 1/2, b = -1/2, c = 1$"	change a, b values
p.199	Problem 31, line 3	"$z' = \frac{1}{2}z$"	change z equation
p.199	Problem 32, line 1	"$u' = 5v$"	change u equation
p.199	Problem 32, line 2	"$v' = -5u + 6v$"	change v equation
p.199	Problem 32, line 3	"$r' = 5r$"	change r equation
p.199	Problem 33, line 1	"$w' = -w + \rho$"	change w equation
p.199	Problem 33, line 2	"$\rho' = -2w + \rho$"	change ρ equation
p.199	Problem 33, line 3	"$\theta' = -2\theta$"	change θ equation
p.199	Problem 35, line 1	"$U' = -U - 2V$"	change U equation
p.199	Problem 35, line 2	"$V' = U - 2V$"	change V equation
p.199	Problem 35, line 3	"$W' = -W$"	change W equation
p.204	Equation for I_{n+1}	"$-Q^E_{n+1}$"	change last term
p.204	Equation for Q_{n+1}	"$Q_n + \frac{h}{2}(I_n - Q_n + I^E_{n+1} - Q^E_{n+1})$"	change equation
p.207	Definition 6.1.2, line 2	"$u' = -u - 2v$"	delete "π"

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p.225	last line	"Figure 5.1.1(a)"	not "5.1(a)"
p.226	Example 2, line 5	"Figure 5.1.1(b)"	not "5.1(b)"
p.240	Problem 9	"$y' = x + y(1 - x^2 - y^2)$"	change last "+" to "-"
p.255	Example 5, line 6	"$\lambda_2 = i\sqrt{2}, \lambda_3 = -i\sqrt{2}$"	not $2i$ and $-2i$
p.272	Problem 18, line 1	"into intervals"	delete "several"
p.275	Inverse Transform, lines 8-9	"set of continuous functions"	insert "continuous"
p.282	Example 8, last equation	"$4, \quad$ for $t \geq 4$,"	not "$2, \quad$ for $t \geq 4$,"
p.347	Section 2.1, after **29.**	"**31.** $x_1 = 1$, $x_2 = -1$"	insert
p.348	Section 2.2, answer **29.**	"11.00 years"	
p.349	Section 2.3, answer **27.**	"$x(t) = \pm\sqrt{\frac{a}{b+ke^{-2t}}}$"	"$\pm$" in front
p.349	Section 2.3, answer **39.**	"$\ln t - 2$"	denominator
p.354	Section 2.4, answer **37.**	"$1 \leq \alpha < 2$"	
p.354	Section 2.5, answer **17.**	"$\phi_n = 4\sum_{k=2}^{n} \left(\frac{t}{2}\right)^k \frac{1}{k!}$"	2 terms wrong
p.355	Section 2.5, answer **21.**	"$\phi_1(t) = \phi_2(t) = \phi_3(t) = 1 - \cos t - t$"	
p.355	Section 2.6, answer **9(a).**	"... all n. $x(t) = 3$ is an equilibrium."	
p.355	Section 2.6, **9(b)**, line 2.	"$x(t) = \frac{3(1-e^{-t})}{3e^{-t}+1}$"	replace equation
p.355	Section 2.6, **11**.	"(a) 0 (b) 0"	
p.355	Section 2.6, **13**.	"(a) 0 (b) 0"	
p.357	Section 3.2, answer **5.**	"$\frac{\sqrt{11}}{2}$"	replace "$\sqrt{11}$" twice
p.357	Section 3.2, answer **19.**	"$x(t) = -\tan^{-1}\left(\frac{t}{2}\right) + 1$"	minus
p.357	Section 3.2, after **35.**	"**39.** $T = 2\pi\sqrt{\frac{g\rho_{\text{box}}}{L\rho_{\text{water}}}}$"	insert
p.358	Section 3.4, answer **11.**	"$x(t) = A(t)\cos\frac{(\omega+\omega_0)t}{2}$ with $A(t) = -\frac{2a}{(\omega^2-\omega_0^2)}\sin(\omega-\omega_0)\frac{t}{2}$"	replace
p.365	Section 3.5, answer **39.**	"perpendicular to the x-axis."	not "at"
p.366	Section 4.1, answer **15.**	"form identical planes."	replace "two parallel"
p.368	Section 4.3, answer **13.**	"$y(t) = c_1e^{\alpha t}(\alpha\cos\beta t - \beta\sin\beta t) + c_2e^{\alpha t}(\alpha\sin\beta t + \beta\cos\beta t)$"	insert β's in y equation for $\lambda_{1,2}$
p.368	Section 4.3, answer **19.**	"$e^{-0.0089}$"	not "$e^{-0.089}$"
p.383	Section 6.3, answer **11.**	"$\theta(t)$"	not "$\Theta(t)$"