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Set 2 of Corrections for Jackson's Classical Electrodynamics, 3rd edition,
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This set consists of corrections and additions (up to February 28, 2001) not included
in the 5th printing of March 2000 or the 6th printing of January 2001, but incorporated in the
7th printing of September 2001. If your printing is the seventh, all these corrections should be
already incorporated. Check the last number in the list of numbers at the bottom on the back
of the title page to see what printing you have.

If your printing is the fifth or sixth, this Set 2 is relevant. If you wish corrections for
any of the first four printings, see this set and also Set 1 below.

p. viii - Add Michael A. Lee and Kevin E. Schmidt to the list of names being thanked.
p. 11 - 5 lines up - Replace the equation with $P = D - \varepsilon_0 E$
p. 42 - line below (1.57) - Add subscript 1 in the denominator of $\rho = (x - x_1)/|x_1 - x_2|$
p. 52 and 53 - Replace Problem 1.14 with

1.14 Consider the electrostatic Green functions of Section 1.10 for Dirichlet and Neumann
boundary conditions on the surface $S$ bounding the volume $V$. Apply Green’s theorem (1.35)
with integration variable $y$ and $\phi = G(x, y)$, $\psi = G(x', y)$, with $\nabla_y^2 G(z, y) = -4\pi \delta(y - z)$. Find an expression for the difference $[G(x, y) - G(x', y)]$ in terms of an integral over the
boundary surface $S$.

(a) For Dirichlet boundary conditions on the potential and the associated boundary condition
on the Green function, show that $G_D(x, x')$ must be symmetric in $x$ and $x'$.
(b) For Neumann boundary conditions, use the boundary condition (1.45) for $G_N(x, x')$ to
show that $G_N(x, x')$ is not symmetric in general, but that $G_N(x, x') - F(x)$ is symmetric in $x$
and $x'$, where

$$F(x) = \frac{1}{S}\oint_{S} G_N(x, y)da_y$$

(c) Show that the addition of $F(x)$ to the Green function does not affect the potential $\Phi(x)$.
See problem 3.26 for an example of the Neumann Green function.

p. 53 - Problem 1.18 (a) - Replace $d^3 x'$ by $da'$ in the integral on the right.
p. 54 - Problem 1.20 (c) - At the end, replace “the diameter of the other wire?” with “its
diameter?”
p. 88 - Problem 2.11 (d), last line - Replace “the force on the charge.” with “the force per unit
length on the line charge.”
p. 94 - Problem 2.30 - Add at the end, “[\psi = 4\pi\varepsilon_0 \Phi]”
p. 133 - Equation (3.185) - Replace $|z|$ in front of $\tan^{-1}$ with $|z|/a$. 


3.19 (c) Show that the charge density at $\rho = 0$ can be written as the series

$$\sigma(0) = -\frac{q}{2\pi L^2} \sum_{n > 0, \text{odd}} \left[ \frac{(n - z_0/L)^{-2} - (n + z_0/L)^{-2}}{n} \right]$$

p. 144 - Problem 3.26 (b) - Replace $\lambda + \mu/r$ on RHS with $f(r)$. Replace “$\lambda$ and $\mu$ are” in the line below with “$f(r)$ is” In the next line replace “$\lambda$ and $\mu$ with “$f(r)$” In the end of the parenthetical remark, add “with a suitable choice of $f(r)$.”

p. 157, line above Figure 4.6 - Replace “polynomials” with “functions”

p. 158, first line - replace “polynomial” with “function”

p. 158, second line - After the word “leads”, add “(through the orthogonality of $P_1(\xi) = \partial P_1(\xi)/\partial \theta$)”

p. 158, line above (4.52) - After “gives”, add “(through the orthogonality of $P_\ell(\xi)$)”

p. 162, 3 lines below (4.70) - Replace $(\epsilon/\epsilon_0 - 1)(\epsilon/\epsilon_0 + 2)$ with $(\epsilon/\epsilon_0 - 1)/(\epsilon/\epsilon_0 + 2)$

p. 217, second last equation - Replace $\rho_\text{max}^2$ with $\rho_\text{max}^3$ in right hand expression

p. 227, Problem 5.9, equation for $\mathbf{J}$ - Replace $\mathbf{\Phi} \mathbf{I}$ with $\mathbf{\Phi} \mathbf{I}$ (boldface phi-hat, italic I )

p. 227, Problem 5.9 (b) - Replace “multiple” with “multipole”

p. 231 - Problem 5.25 (c) - In the first line, after the word “plane,” add “is parallel to the wire and”

NOTE: In the process of adding this clarification in the seventh printing, the incorrect answer of the first four printings was reintroduced. The correct answer for the interaction energy is

$$W_{12} = \mu_0 I_1 I_2 \int d\xi \left[ e^{i\xi} - \sqrt{e^{2i\alpha} - a^2/d^2} \right]$$

p. 293 - Problem 6.24 (b) - To first order there is no magnetic field outside the solenoid.

Replace the equation for $\mathbf{B}$ with $\mathbf{B} = 0 + O(\partial^2 I/\partial t^2)$. Two lines below the equations, delete “a magnetic field and”. Delete the last sentence.

p. 296, line 3 - Add the words “and positive” after “real”


p. 332, line 3 - Replace $\delta(7.77)$ by $\delta(5.165)$

p. 342 - Problem 7.7 - In second line of preamble, add “nonpermeable” in front of “media”; in part (a), second line, add “smooth and” before “finite”.

p. 344 - Problem 7.10 - In the fourth and fifth lines, replace $-\omega t$ with $-i\omega t$
p. 349 - problem 7.24 (a) - Add at the end of (a) “Assume that (7.114) holds for real $\omega$."
p. 349 - Problem 7.26 (b) - Replace “electrostatic” with “scalar”
p. 350 - Problem 7.27 - In part (a) add a comma after “that” in the second line. In part (b), third line below the first equation, delete “xy” in front of “plane”
p. 350 - Problem 7.29 - In the third line, add “in vacuum” after the word “wave”
p. 351 - Problem 7.30, second line - Change “(7.11)” to read “(7.8, 7.11)”
p. 373, equation (8.97) - The numbers are a bit off. Replace “0.344” with “0.343” in the numerator and “0.242” with “0.244” in the denominator.
p. 389, six lines below (8.128) - Add “a” after $\omega$ to make $V$ dimensionless.
p. 396 - Problem 8.1 - In part (a), third line, after the word “surface” add “from the conduction current”. Replace part (b) with

“(b) If the magnetic permeability $\mu$ outside the surface is different from $\mu_c$, is there an additional magnetic force per unit area? What about electric forces?”
p. 397 - Problem 8.2 - At the end of the preamble, add “Section 8.1 applies.”
p. 398 - Problem 8.4 - In second line, replace “brass” with “conductivity $\sigma$”. In part (a), last line, replace “brass” with “the cylinder” In part (b), first line, replace “constant” with “constants”; second line, add “distinct” before “modes” and replace “it” with “them”
p. 400 - Problem 8.10 (b) - Replace $B$ in both equations with $E$. (i.e. $E_0$)
p. 402 - Problem 8.13 - parenthesis in fourth line - replace first “or” with “of”; In part (a), add a left parenthesis, (, before $\gamma^2$ in the first equation, i.e., $[(\gamma^2 - \gamma_0^2)]N_j \delta_{ji} + ....$
p. 403 - Problem 8.15 (a) - In the third line, after “mode”, add “, defined by the symmetry in $x$ of the transverse fields.”
p.434, first line - Replace “superpositon” with “superposition”
p. 435, equation (9.146) - Add left parenthesis, (, before $N_x^2$
p. 437, two lines above (9.151) - replace “multiple” with “multipole”
p. 439 - line above (9.157) - Replace $H' = B/\mathcal{M}_0$ with $H' = B/\mu_0$
p. 453, Problem 9.15 (b) - In equation for $H$ add left parenthesis, (, before $\hat{x}$
p. 454 - Problem 9.18 - In parts (a) and (b), delete the final factors in curved parentheses in both equations.
p. 484 - In the first term of the integrand of (10.90), replace $k$ by $\omega$
p. 507, line 17 - Replace Beugunswele with Beugungswelle
p. 509 - Problem 10.5 (b) - The correct page number in the edition of Landau and Lifshitz cited in the Bibliography is p. 323.
p. 509 - Problem 10.7 (c) - Replace “$\epsilon \to \infty$” with “$\epsilon \to \infty$”
p. 572 - Problem 11.16 (c) - Replace “above (7.68)” with “$J = \sigma(E + \mathbf{v} \times B)$ (see p. 320).”
p. 578 - Problem 11.31 - In the denominator of the expression for $E_\rho$, $\omega^2 / c^2$ should read $\omega^2 \rho^2 / c^2$. On RHS of the equation for $V$, there should be a factor of $c$ in the denominator.
p. 617 - Problem 12.1 (a) - At the end of the first line, add “(in the sense of Section 12.1 B)”
p. 621 - Problem 12.15 (b) - In second line, after the word “field” add “away from the origin”
p. 628, second line - delete “a” before “consonant”
p. 634, equation (13.35) - The lower limit on the integral should be “$a$”
p. 639, sixth line below Figure 13.4 - Replace “bow shock of a boat in water or the shock front accompanying” with “familiar shock wave (sonic boom) produced by an aircraft in”
p. 668, line 9 - Replace “50 GeV” with “60 GeV”
p. 691 - Figure 14.15 caption - Replace “first harmonic” with “second harmonic”
Set 1 of Corrections for Jackson's Classical Electrodynamics, 3rd edition.

p. 103 - in last three equations replace q by \( q/4\pi \epsilon_0 \).
p. 103, line above the third equation from the bottom - Replace \( q \) by \( q/4\pi \epsilon_0 \).
p. 104 - first equation, replace \( q \) by \( q/4\pi \epsilon_0 \).
p. 154, line 2 up - last word should read "charge" not "change."

p. 156 - Fig. 4.5 - reverse the inequality sign below the RH sketch, i.e., \( \epsilon_2 < \epsilon_1 \).

p. 188 - equation (5.63), replace \( \mu_0 \) on RHS by \( 4\pi \).

p. 228 - Problem 5.15 (a), on RHS replace \( I \) by \( O \).
p. 231 - Answer for the interaction energy in Problem 5.25 (c) should read

\[
W_{12} = \mu_0 I_1 I_2 d \cdot \text{Re} \left[ e^{i\alpha} - \sqrt{\alpha^2 - a^2/d^2} \right]
\]

p. 234 - Problem 5.34 (c), insert minus sign on RHS.
p. 287 - Problem 6.7 (b), delete \( 4\pi \) on RHS of display equation
p. 289 - Problem 6.14 (b), delete \( c^2 \) from denominator in integral of \( w_m \) on RHS.
p. 294 - Problem 6.25 (a), replace "an atom" by "a neutral atom at rest".
p. 298, Equation (7.13) - Add a factor of \( 1/2 \) to the right hand side.
p. 410 - a factor of \( 1/4\pi \epsilon_0 \) is missing on the RHS of the two unnumbered equations for \( \Phi \).
The following “corrections” concern rectification of the universal attribution to Hendrik A. Lorentz of those things that should rightly be attributed to Ludvig V. Lorenz.
and discussed the characteristics of light propagation in conductors and transparent media, contemporaneously with Maxwell. H. A. Lorentz has ample recognition in physics terminology without the mis-attribution of (6.14) to him (by others, beginning around 1900). As Van Bladel* observes, it is up to textbook authors to accord Lorenz his due.†


p. 408 - line 2 - change Lorentz to Lorenz.
p. 450 - Problem 9.5(a), line 2 - change Lorentz to Lorenz.
p. 555 - lines 13, 17, and 24 - change Lorentz to Lorenz. [but not in lines 9 and 21!]
p. 601 - line 2 - change Lorentz to Lorenz.
p. 604 - line 6 - change Lorentz to Lorenz.
p. 612 - line 13 - change Lorentz to Lorenz.
p. 760 - line 12 - change Lorentz to Lorenz.
p. 799 - Change the entries
   Lorentz condition, 240, 555
   in covariant form, 555
   to read
   Lorenz condition, 240, 294, 555
   Lorenz condition. See Lorenz condition.