Errata for "A Journey into Partial Differential Equations"

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Since the appearance fo the text in print, several typos have been discovered as follows.

1. Page 28. Figure 1.8 depicts pacial snapshots of the solution for select time values, not shapshots in space-time as written in the text.

2. Page 69. It is stated at the top of the page that a point charge produces an electric field inversely proportional to the distance from teh charge. This should say: the *magnitude* of the electric field produced by a point charge is inversely proportional to the *square* of the distance from the charge. The law was correctly stated earlier in the text, see page 64.

3. Page 81, Exercise 3.13, the conclusion on α should be: $\alpha = in$, $n \in \mathbb{Z}$.

4. Page 95 Exercise 3.27, the equation should be $u_{tt} = c^2 u_{xx} - ru_t$.

5. Page 121, Exercise 4.24, the equation should be $u'' - \mu^2 u = f$.

6. Page 131. Formula (5.19) should read:

$$\int_0^\pi \sin nx \sin mx \, dx = \begin{cases} 0, & n \neq m \\ \pi/2, & n = m \end{cases}.$$

7. Page 161, the function should be $f(x) = x - \frac{\pi}{2}$ for $\frac{\pi}{2} < x < \pi$.

8. Page 174, the Fourier expansion for $G(x, \xi)$ (last formula on page) should have a minus sign in front of the sum. Likewise in Example 5.21 on the next page.

9. Page 183, the second boundary condition for X should be $X'(L) + hX(L) = 0$. Also, the equation for the values of λ should be $\tan \lambda L = -\lambda/h$.

10. Page 189. the definition for Q should be

$$Q(x,t) = \begin{cases} Q_0 x(L-x), & 0 < t < t_0 \\ 0, & t > t_0 \end{cases}.$$

    Second, third, and fourth formulas, replace the number 4 by 8. Also, in the second formula and third formulas, there should not be an α^2 in the denominator. Consequently, in the fourth formula on the page, the power of α should be α^2.

11. Page 193, Exercise 6.4 the asymptotic form for u should be $u(x,t) = \frac{x}{\pi} + \frac{4}{\pi} e^{-\alpha^2 t} + O(e^{-2\alpha^2 t})$.

12. Page 206, the third formula from the bottom, the integration region for the integral on the left hand side is R (its given as D).

13. Page 194, Exercise 6.13, the formula to be proved is $\widehat{D^m f}(n) = (-1)^m \lambda_n^{2m} \widehat{f}(n)$.

14. Page 215, Exercise 6.28, replace ∇^2 by $-\nabla^2$.

15. Page 229, in the third formula the power of ρ is given as $n-1$, it should be $d-1$ (in two places).

16. Page 223. The formula after (7.1.7), the first line should read:

$$|x - \xi^*|^2 = a^2 - 2\left(\frac{a^2}{|\xi|^2}\right) x \cdot \xi + \left(\frac{a^2}{|\xi|^2}\right)^2 |\xi|^2$$

17. Page 242. In equation (7.4.2), the right hand side should be $u(x)$. Likewise for equation (7.4.5) on page 243.

18. Page 245. Second line from the bottom there is a typo in the formula for the surface element; it should be $dS = a^{d-1} d\omega'$.

19. Page 248. There is a silly error in the inequality in the final line; it should read:

$$(a-\rho)^2 \le a^2 - 2a\rho(\omega \cdot \omega') + \rho^2 \le (a+\rho)^2.$$

This manifest in the two inequalities at the top of page 249: $a - \rho$ and $a + \rho$ should be interchanged in the denominators of both inequalities. This does not affect the process of the proof.

20. Page 250, equation (7.4.17) the exponent in the denominator should be $d/2$ not $n/2$.

21. Page 254, Exercise 7.25 should be "Show that $G(x,\xi) \le 0$...". Likewise in Exercise 7.26 should be "Show that $\frac{dG}{dn_x} \ge 0$...".

22. Page 262, in the formula for $u(r,\theta)$ in the middle of the page, the power on $\frac{r}{a}$ should be $\frac{n\pi}{\alpha}$.

23. Page 279, equation (8.2.9) for the generating function has a typo; the correction is

$$\frac{1}{\sqrt{1-2\rho x+\rho^2}} = \sum_{l=0}^{\infty} \rho^l P_l(x).$$

Likewise in formula (8.2.10), the x^2 should be ρ^2.

24. Page 285, Exercise 8.2, the conclusion should be $(2l+1)I_l = 2lI_{l-1}$.

25. Page 297, Exercise 8.14, the partial differential equation to be solved is $\nabla^2 u = -4\pi q \delta_\xi$. (The -4π is missing in the text.) Same for Exercise 8.15 on the same page.