Thanks to Bill White for encouraging me to write this errata sheet, and pointing out a few of the entries below.

p. xx, l yy = page xx, line yy. (If yy is negative then count lines up from the bottom of the page.)

“About the author,” l 1. I’m an associate Professor now! Also the research paper count is off. Not sure what it is now. Check my web page.

p. 20, l 13-15. “We can evaluate... = 1.” Remove these lines. Not sure why they are there.

p. 20, l -1. The fourth part of problem 14 should be
\[ \lim_{(x,y) \to (0,0)} \frac{x^2y^2}{x^6+y^3} \]

p. 67, l -7,-8. In the statement of both parts of Problem 53 there is an extra comma toward the end of the line, after \( \theta \).

p. 89, l 10. In Example 7-19 it says “... spanned by the vectors \( \langle 1,2 \rangle \) and \( \langle 4,3 \rangle \).” It should say “... spanned by the vectors \( \langle 1,2 \rangle \) and \( \langle 3,4 \rangle \).”

p. 100, Figure. In the center of the figure there is the label \( \Psi(t_{i+1}) \Psi(t_i) \). There is a missing minus sign here. It should read \( \Psi(t_{i+1}) - \Psi(t_i) \)

p. 103, l -15. \( \Delta t_i \to \infty \) should be \( \Delta t_i \to 0 \).

p. 112, l -5. The statement of Problem 88 should read “Derive a formula for the surface area of the graph of the spherical equation \( \rho = f(\phi) \).”

p. 118, l 8. Replace the word “cone” in the statement of Problem 93 with the word “paraboloid.”

p. 137, l 2. There is an extra comma toward the end of the line, after \( t \).

p. 140, l 7,11,-4. There are a lot of derivatives here that should be partial derivatives. Also, there are several \( u \)’s that should be \( v \)’s. Line 7 should read: “vectors \( \frac{\partial \Psi}{\partial u} \) and \( \frac{\partial \Psi}{\partial v} \) are both tangent to \( S \). Hence, the vector \( \frac{\partial \Psi}{\partial u} \times \frac{\partial \Psi}{\partial v} \) is perpen-.” In the integral in line 11 it should be \( \frac{\partial \Psi}{\partial u} \times \frac{\partial \Psi}{\partial v} \). And this should also appear at the end of line -4.

Date: October 13, 2009.
p. 142, Problem 113. At the end of the problem statement there should be a line added: “Use the induced orientation.” (Just like in Problem 112.)

p. 147, l -3.-2. This sentence just isn’t right. Instead of “Then the force of gravity...”, it should say: “Then the work you have to do to overcome gravity by going uphill at the point \((x, y)\) is proportional to the vector \(\nabla f(x, y)\)”

p. 162, l -1. There is a missing minus sign in the second coordinate. It should read
\[
\nabla \times \mathbf{W} = (-\cos z, -\sin z, 0)
\]

p. 163, l 11. Two mistakes in this line. It should read: “So, on the plane \(z = 1\) we have \(\nabla \times \mathbf{W} = (-\cos 1, -\sin 1, 0).\)”

p. 166, l 6. In the first sentence of Problem 132 it should read, “...centered at the origin with radius 0.1,”

p 168, l -5. The \(\times\) symbol at the beginning of the line should be a “.” symbol.

p 168, l -4. Replace \(\cos \phi\) with \(\cos ^2 \phi\).

p. 170, l 2,3,4. The “\(\times\)” symbol should be a “.” symbol in all three lines.

p. 184, l 5-8. The solution given to the fourth part of Problem 14 was not right, so I changed the problem statement (see correction on page 20 above). The correct solution for the new problem here should read:

Along the \(y\)-axis
\[
\lim_{(x,y)\to(0,0)} \frac{x^2 y^2}{x^6 + y^3} = \lim_{(x,y)\to(0,0)} \frac{0}{y^3} = 0
\]

Along the curve \(y = x^2\)
\[
\lim_{(x,y)\to(0,0)} \frac{x^2 y^2}{x^6 + y^3} = \lim_{(x,y)\to(0,0)} \frac{x^6}{x^6 + x^6} = \frac{1}{2}
\]

p. 190, l -3, -2,-1. There are sign issues with the last three lines, and the answer isn’t right. These last three lines should read:

\[
\begin{align*}
&= - \cos \left( \frac{\pi}{2} + y \right) + \cos \frac{\pi}{2} \\
&= - \cos \pi + \cos \frac{\pi}{2} + \cos \frac{\pi}{2} - \cos 0 \\
&= 0
\end{align*}
\]
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p. 197, l -5. The final answer to Problem 39 should be
\[ \frac{1}{2} (\cos 6 - \cos 8 - \cos 5 + \cos 7) \]

p. 198, Solution to Problem 42. The third figure is not situated correctly. The two lobes should be oriented vertically, so that the surface is centered on the \( z \)-axis. This can be fixed by rotating the figure 90 degrees clockwise.

p. 199, l 3. Delete the word “negative”

p. 200, l -4. The answer for part 2 of Problem 49 should read:
\[ \frac{\pi}{2} \leq \theta \leq \pi, \quad \frac{\pi}{2} \leq \phi \leq \pi \]

p. 202, l -5. Limits on \( z \) should be \( 0 \leq z \leq 4 \).

p. 203, l -1. Answer should be \(-\frac{9}{15} = -\frac{3}{5}\).

p. 207, l 3. It says “... we get imaginary answers.” This is wrong! Plugging \( y = -\frac{4}{3} \) into \( x^2 + \frac{y^2}{4} = 1 \) and solving for \( x \) gives \( x = \pm \frac{\sqrt{5}}{3} \). So \( \left( \pm \frac{\sqrt{5}}{3}, -\frac{4}{3} \right) \) are also critical points.

p. 207, l 9. The new critical points above have to also be checked:
\[ f \left( \pm \frac{\sqrt{5}}{3}, -\frac{4}{3} \right) = \frac{5}{9} + \frac{16}{9} - \frac{8}{3} - 1 = \frac{-4}{3} \]
so \(-2\) is still the minimum, as stated.

p. 208, l -1. The signs on the first two coordinates should be switched.

p. 210, l -5. Delete the line that says \( \lambda = \frac{1\pm\sqrt{10}}{2} \). I have no idea why this is there.

p. 216, l 1. There should be a \( \frac{1}{3} \) in front of \( t^3 \). The line should read:
\[ \int_C f(x,y) \, ds = \int_0^1 f \left( \frac{1}{3}t^3, t \right) |(t^2, 1)| \, dt \]

p. 235, l -4. Missing minus sign. The determinant of the matrix should equal \( \langle -y, x, 0 \rangle \).

p. 235, l -1. The limits on \( \theta \) are wrong. Should be \( 0 \leq \theta \leq \frac{\pi}{2} \).