

## I. Corrections

*Last Updated: June 2010*

**Complex Variables with Applications, 3<sup>rd</sup> edition**, A. David Wunsch  
**First Printing.** A book bought **before May 2007** will probably be a first printing

With Thanks to Christian Hoas of Sweden

**page 11** equation (1.2-10c), break the bar over the right side in the middle

**page 28** problem 2 change “multiplication” to “division”

**page 29** In the footnote “The expression  $\frac{n!}{k!(n-k)!}$  ...” there is a factorial missing.

**page 30** In the line above Eq (1.4-9) change  $z = r\angle\phi$  to  $z = r\angle\theta$

**page 33** line 10  $0.574-i0.995$ ,  $k=4$ .

**page 42**, line 2, change “some path of straight line segments” to “some path of arcs or line segments”

**page 44** line 3 change complex place to complex plane

**page 44** line 3, change  $z \leq 1$  to  $|z| \leq 1$

**page 46** problem 18, change  $8 + i$  to  $0.8 + i$

**page 62**, problem number 10 should have  $z^2 - 3iz - 2$  instead of  $z^2 - 3i - 2$  in the denominator of the fraction. There was a  $z$  missing.

**page 92** Equation (2.6-13) is wrong:

on the left side only, replace  $\frac{d\phi}{dx}$  with  $\frac{d\Phi}{dz}$ . Keep the overbar and parenthesis on the left side.

The right side of the equation is correct.

**page 106** Problem 2 should have  $e^{\frac{1}{2}+2i}$  instead of  $e^{1/2+2i}$  ;

Problem 3 should have  $e^{\frac{1}{2}-2i}$  instead of  $e^{1/2-2i}$

Problem 5 should have  $e^{\frac{1}{2}+2i} e^{\frac{1}{2}-2i}$  instead of  $e^{1/2+2i} e^{-1/2-2i}$

**page 111** In Example 1, 3<sup>rd</sup> line, change  $y = 0$  to  $y = \theta$ .

**page 114** in problem 9, add “ $n \neq 0$ ” after (natural log).

**page 119** Problem 23, the expression  $\text{Log} \left| 2 \cos \theta \left( \frac{\theta}{2} \right) \right|$  if... is wrong and must be

replaced with  $\text{Log} \left| 2 \cos \left( \frac{\theta}{2} \right) \right|$  if ...

In problem 24 , on the right side need to have  $\frac{1}{2} \text{Log}(1 - 2r \cos \theta + r^2)$  if...

Note that the  $\theta$  was missing in the book

**page 127**, problem 11 c) Answer in back (page 662) should say  
“Note that  $-2+i$  is not in cut plane.”

**page 132** problem 2, change  $i^{-1}$  to  $i^{-i}$

**page 137** For problem 4, section 3.7, there is a sign error in the second answer in the solutions manual: need  $i$  1.76

**page 163** line 7 Change  $f(z_1) = \frac{1}{s} 4 + \frac{i}{16} + 1$  to  $f(z_1) = \frac{1}{4} + \frac{i}{16} + 1$ , the expression given for  $f(z_1)$  in the text is wrong.

**page 169** In Example 4, first line, the lower limit of the integral is wrong. It should be  $1 + i0$  and not  $i + i0$ . Thus we want  $\int_{1+i0}^{0+i1} e^{1/z} dz$

**p. 170** problem 2, error in solutions manual, the numerical ans. is correct, but need upper limit of 2 for the y integrals.

**p. 189** in **EXAMPLE 3** part c) “Verify Theorem 8 ...”, should be changed to “Verify Theorem 7”

**page 199** Problem 4, should read “around  $|z| = 2$ ”

**page 199** problem 6, error in solution manual, need  $\sqrt{3}$  in denominator in answer

**page 211** problem 1 should have  $\frac{1}{2\pi} \int_0^{2\pi} e^{e^{i\theta}} d\theta = 1$  [note that the  $d\theta$  is missing in the text.]

**page 213**, problem 17(d) the right hand side should be  $\frac{\pi}{2} \frac{(2n)!}{(n!)^2 2^{2n}}$

[note that there was a 2 missing in the exponent].

**page 237** On the top line of the page I should refer to Eq. (5.2-8) not Eq. (5.2-7).

**page 238** EXAMPLE 6 Use Theorem 2 to show that the series of Example 3 ... diverges for  $|z| \geq 1$  .[instead of  $|z| > 1$  ]

**page 238 DEFINITION (Absolute and Conditional Convergence)** The word Conditional should be deleted from the definition.

**page 244, “ Solution .** From Eq. (5.2-7) ..” should change (5.2-7) to (5.2-8).

**page 244 EXAMPLE** “convergent in any 1 circular region” remove the 1 .

**page 244** Four rows from bottom of page, change “From Eq. (5.2-7)...” to “From Eq. (5.2-8)...”

**page 247** problem 5, there is a mild error in the solutions manual where the sum of the series of  $M_n$  terms is incorrectly stated.

**page 261**, problem 18,  $\frac{1}{z^{1/2} + 1}$  should appear on the left side of the equation, i.e., change the minus sign on the left in the text to a plus sign.

**page 275** line 6 should read “with the aid of (a)...” i.e. change the (b) in the text to (a).

**page 291** “In Figure 5.6-5 (a) , we have plotted ...”, note that the (a) is missing in the text.

**page 291**, “For comparison, we have plotted in Fig. 5.6-5 (b)...” Note that the (b) is missing in the text.

**page 305** , change wording in problem 14 to read

...is analytic in the disc  $|z| \leq r$  where  $r < 1$ , and is undefined for  $|z| \geq 1$ .

**page 314** In Equation(5.8-11) change the lower case  $f(w)$  to the cap  $F(w)$

**page 341** In problem 6 we want  $\oint \cosh(1/z)dz$  , i.e., remove the  $\sum$

**page 351 problem 20** answer in solutions book is partly incorrect. have *simple* pole at  $z = 1$  other poles are second order

**page 357** problem number 4, part (a). The solutions manual is correct in asserting that there is no pole at  $z = 0$  . However the proof of this given in the manual is wrong. The manual should show that  $\lim_{z \rightarrow 0} f(z) = 0$  which proves that the given function does not have

a limit of infinity as zero is approached. Note that the manual fails to say that the residue at  $z = 1$  is zero.

**page 397** line 7 in the integral

$$i\pi \int_{-R}^{-\varepsilon} \frac{dx}{z^2 + 4} \text{ change the } z \text{ to } x \text{ in the denominator to read } i\pi \int_{-R}^{-\varepsilon} \frac{dx}{x^2 + 4}$$

**pages 416- 430.** Note that  $\lim \varepsilon \rightarrow 0$  should be changed to  $\lim \varepsilon \rightarrow 0+$  throughout section 6.10.

**page 442** 5 lines from bottom of page, “To choose another example, it ...” change it to if

**page 444 :**

**line 7 should read**

$$f(z) = (z - \zeta)^n \phi(z) \quad (6.12-4a)$$

**we have added an equation number here that is (6.12-4a)**

**line 10 should read** “ Note that.... Differentiating Eq. (6.12-4a) we arrive at”

we have changed the equation number from Eq.(6.12) to Eq.(6.12-4a)

**line 12 should read** “Dividing Eq.(6.12-4b) by Eq.(6.12-4a), we obtain”

**page 445** First line of the second paragraph should read “Equations (6.12-6) and (6.12-3) provide two different ways...” Note that we have changed the first equation number which used to be (6.12-2).

**page 445** remove the second bullet mark and move it to **page 447** at the end of the first paragraph, after the words “in this case.”

**page 447** lines 2 and 3, “(compare with Eq. (6.12))” should be changed to “(compare with Eq. (6.12-4a))”

**page 449** problem 3, second figure in the solutions manual for this problem is upside down, e.g.,  $d'$  should be in upper half plane

**page 487** problem 6. The hint should apply to problem 6, not 5 or 7. Move the hint so that it is next to problem (6) or directly underneath it

**page 492 line 14,** Eq.(6.2-10) is wrong and should be changed to Eq.(6.12-9)

**page 505** the following should be used in place of lines 8-12  
A result equivalent to Eq. (7.4-14) is

$$\int_a^b f(x)\delta'(x)dx = \int_a^b -f'(x)\delta(x)dx$$

which can be verified by doing the integration on the right. Similarly

$$\int_a^b f(x)\delta^{(n)}(x)dx = \int_a^b (-1)^n f^{(n)}(x)\delta(x)dx$$

**page 529** final paragraph should read :

“ as a pair of equations  $u = u(x, y)$  and  $v = v(x, y)$ . ”

Note that the  $u$  is missing in  $u(x, y)$ .

**page 662** section 3.5 11 c) Note  $-2 + i$  is not in cut plane. [the word *plane* is missing]

**page 662** section 3.8 The answer to problem 23 b) is incorrect and should be changed to  $2.0782 - i 1.4694$ ,  $1.0634 + i 1.4694$  (for Matlab) The answer to problem 23 c) is incorrect and should be given as c)  $-.6662 - i 1.0613$ , for both.

**page 665** (answer section) for section 5.8, the answer to problem 13 should be

13.  $f(0T) = 0, f(1T) = 0, f(nT) = n - 1$  for  $n \geq 1$ ;

**page 669** the index entry for Bessel function, modified, should be changed to page 404

**page 674** the index entry for limit point should be changed to page 43 from 42

**page 669** The index entry for “accumulation point “ should be pages 43, 47 not the pages listed here

**page 672** at the top left of page, the index entry for both “simply connected” and “multiply connected “ should be page 42, not the page number stated here.

**page 675** index entry for “ratio test “ should include page 240.

**page 675** in index need to add *Ratio test* 231, 240

**page 675** in index need to add *Residue at infinity* 359-60 to index.