Math Diversion Problem 289

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> You either get control of your lusts and feelings of
> entitlement, or they will get control of you.
> — The Author

The YouTube video is found at:

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Source: https://www.youtube.com/watch?v=heY8pAsQ6uU
Title: A System With Conjugates |
          Problem 341
 Presenter: aplusbi
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1 The Problem

Given the relations

$$z + \overline{w} = 3 + 2i \equiv a_0 \,, \tag{1a}$$
$$w - \overline{z} = 5 - 4i \equiv b_0 \,, \tag{1b}$$

find the values of z, w.

2 The Solution

My solution started with taking the complex conjugate of (1b):

$$\overline{w} - z = \bar{b}_0 \,. \tag{2}$$

Now if we subtract (2) from (1a), we get

$$z = \tfrac{1}{2}(a_0 - \bar{b}_0) = -1 - i \,. \tag{3}$$

And if we add (2) to (1a), we get

$$\overline{w} = \tfrac{1}{2}(a_0 + \bar{b}_0) = 4 + 3i \,. \tag{4}$$

Hence,

$$w = 4 - 3i \,. \tag{5}$$