Principles of Mathematical Analysis Test

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1 The Real and Complex Number Systems

1.1 Theorem If a and b are real, then $(a, b) = a + bi$.

Proof

$$\begin{aligned} a + bi &= (a, 0) + (b, 0)(0, 1) \\ &= (a, 0) + (0, b) = (a, b). \end{aligned}$$

1.2 Notation If $x_1, \ldots, x_n$ are complex numbers, we write

$$x_1 + x_2 + \cdots + \sum_{j=1}^{n} x_j.$$

(1) $$i^2 = -1$$