

# 國立臺灣師範大學 103 學年度碩士班招生考試試題

科目：數學教育概論

適用系所：數學系

注意：1. 本試題共 3 頁，請依序在答案卷上作答，並標明題號，不必抄題。2. 答案必須寫在指定作答區內，否則不予計分。

1. 已故英國知名數學教育學者 Richard Skemp 將學生的學習理解方式分成 Relational Understanding 與 Instrumental Understanding 兩類，

- (1) 就這兩類理解方式分別舉數學學習的例子加以闡述。(10 分)
- (2) 試問這兩種理解方式對於中學數學的教學有何啟示？(15 分)

2. 以下是某位學生在解一元三次方程式  $x^3 + 8 = 0$  的步驟：

$$\begin{aligned}x^3 + 8 &= 0 \\x^3 &= -8 \\ \therefore x &= (-8)^{\frac{1}{3}} = \sqrt[3]{-8} = -2 \\ \text{答：其根為} &-2\end{aligned}$$

- (1) 將該生的解答過程抄在答案卷上，然後批改該生的解答。(5 分)
- (2) 若該題滿分 10 分，你會給幾分？為什麼？(5 分)
- (3) 問該生在此題的解法上有甚麼問題？以一個老師的身份來說，你應該怎麼幫助該生？(15 分)

3. 以下式子是學生在「除法的加減法分配律」的錯誤想法。

$$a \div (b \pm c) = a \div b \pm a \div c$$

- (1) 提出兩種不同的可能原因來解釋學生為什麼有這樣的錯誤想法。(10 分)
- (2) 設計兩種不同的教學(一節課的時間)來協助學生改正此錯誤想法，並比較這兩種教學的優缺點。(15 分)

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4. 底下是一段摘自 Qualitative Inquiry 期刊中 On Understanding Understanding 的論文內容(Schwandt, 1999)，請閱讀後回答接下來的問題：

We are in the grip of the text. Almost four centuries ago, Shakespeare opined that “All the world’s a stage, and all the men and women merely players” (“As You Like It”). But as we stand on the verge of the 21st century, we seem to believe that all the world’s a text and all the men and women merely readers. Denzin (1997) has characterized the problems, prospects, and forms of interpretive, qualitative, ethnographic work in the sixth moment of its development as all having to do with the text. Geertz (1983) tells us that social institutions, social customs, and social changes are all in some sense “readable”; Ricoeur (1981) defends the view that social action can be read like a text; Taylor (1985) employs a textual paradigm in explaining the aim of the hermeneutical human sciences; Gadamer’s philosophical hermeneutics appeals to a textual model, and of course, for Derrida and Rorty, *everything* is a text. In sum, the text is the primary model for the object of interpretation.

But, as Gallagher (1992) explains in *Hermeneutics and Education*, if all interpretation is modeled on textual interpretation, “it follows that interpretation must be a kind of reading, since its object is always a kind of text” (p. 321). Gallagher argues that

the modern, Romantic emphasis on the interior subject, the mind as the theatre of interpretation (in contrast to the public theatre of the ancients), goes hand in hand with the focus on textual interpretation, where interpretation is reading and reading is an interior process. To the extent that modern hermeneutics takes its orientation from the text as its model object and makes interpretation a silent reading, and thus an interior understanding, it tends to exclude explication, pedagogical presentation, and educational experience from the interpretive process. (p. 325)

There are two problems with modeling understanding on the reading of a text. First, as Gallagher suggests, in such a model, understanding and interpretation become private, “interior” undertakings. To be sure, at least two current conceptions of reading—the interactive and the transactional or constructionist approaches (Straw & Sadoway, 1990)—define reading as a generative act involving both text and reader, yet that act remains largely internal. It is internal (or “interior”) in the sense that understanding and interpretation

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are under the control of a self-reflective, autonomous, rational subject. Reading is conceived of as a mental act, an activity of an individual conscious mind. Self-reflection and autobiography are primary starting points for reading. Second, when we model understanding on textual interpretation, on reading comprehension, we are inclined to conceive of the task of understanding as that of the interior, private reconstruction (or construction) of meaning (i.e., understanding) followed by the public representation of that meaning (i.e., interpretation).

- (1) 用少於 100 字摘要上述內容。(10 分)
- (2) 提出你對此論文內容的看法(至少列出三點)。(15 分)

