國立彰化師範大學 98 學年度碩士班招生考試試題

系所：科學教育研究所　　組別：甲組　　科目：數學教育

☆☆請在答案紙上作答☆☆　　

Part I.

一、 寫出畢氏定理及其逆定理?學習畢氏定理的目的和價值是什麼? (20%)

二、 設計一份畢氏定理的教案。(20%)

三、 命一份有關畢氏定理學習成就的試題。(10%)

Part II.

一、 名詞解釋 (請翻譯並解釋下列專有名詞，25%)

1.alternative conception
2.generalizing
3.ZPD (zone of proximal development)
4.PK (pedagogical knowledge)
5.constructivism

二、 請寫出以下文句的大意並加以詮釋：(25%)

Mathematical proficiency has five interwoven and interdependent components:

1.*Conceptual understanding:* Comprehending mathematical concepts, operations, and relations—knowing what mathematical symbols, diagrams, and procedures mean.
2.*Procedural fluency:* Carrying out mathematical procedures flexibly, accurately, efficiently, and appropriately.
3.*Strategic competence:* Being able to formulate problems mathematically and to devise strategies for representing and solving them using concepts and procedures appropriately.
4.*Adaptive reasoning:* Having the capacity for logical thought, reflection, explanation, and justification; using logic to explain and justify a solution to a problem or to extend from something known to something not yet known.
5.*Productive disposition:* Seeing mathematics as sensible, useful, doable, and worthwhile, coupled with a belief in diligence and one's own efficacy.

(Kilpatrick, Swafford & Findell, 2001, p.116)