

國立彰化師範大學 100 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☆☆

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一、名詞解釋（請翻譯並解釋下列專有名詞，每題 6%，共計 30%）

- (1) number sense
- (2) generalisation
- (3) conjecturing
- (4) “doing” mathematics
- (5) mathematisation

二、請寫出以下文句的大意並加以詮釋（20%）

Mathematics is amazingly compressible: you may struggle a long time, step by step, to work through some process or idea from several approaches. But once you really understand it and have the mental perspective to see it as a whole, there is often a tremendous mental compression. You can file it away, recall it quickly and completely when you need it, and use it as just one step in some other mental process. The insight that goes with this compression is one of the real joys of mathematics.

(引自 Thurston, W. P. (1990). *Mathematical education, Notices of the American Mathematical Society*, 377, p. 847.)

三、PISA 2012 給數學素養(Mathematical Literacy)下的定義如下:

Mathematical literacy is an individual's capacity to formulate, employ, and interpret mathematics in a variety of contexts. It includes reasoning mathematically and using mathematical concepts, procedures, facts, and tools to describe, explain, and predict phenomena. It assists individuals to recognise the role that mathematics plays in the world and to make the well-founded judgments and decisions needed by constructive, engaged and reflective citizens.

(1) 試就上述定義，以你的知識和經驗詮釋一下，何謂數學素養。(20%)

(2) 上述所定義之數學素養可否透過教育來提升? 若可，寫下你的理由，並為學校的數學教師擬訂一份培訓計畫綱要(一頁就好); 若否，也請說明你的理由。(30%)