# KI Package Y5, Term 3, Weeks 5-7

# Philosophy of Mathematics

### **Contents**

- Essay Questions on Math
- Reproduced articles
  - a) <u>You are a Mathematician</u>, Chapter 2, "Numbers and Patterns", by David Wells (optional)
  - b) <u>The Number Sense: How the Mind creates Mathematics</u>, "The Language of Numbers", pp. 91-117, by Stanislas Dehaene
  - c) <u>The Number Sense: How the Mind creates Mathematics</u>, "Platonists, Formalists, and Intuitionists", pp. 242-245, by Stanislas Dehaene
  - d) Theory of Knowledge readings (pp.54-58, 192-210)
  - e) <u>The Crest of the Peacock: Non-European Roots of Mathematics</u> (Penguin, 1991) pp. 3-22, by George Gheverghese Joseph
  - f) <u>Life's Other Secret: The New Mathematics of the Living World</u> (Penguin, 1998), Chapter 6, "Flowers for Fibonacci", by Ian Stewart
  - g) <u>You are a Mathematician</u>, "The enjoyment of mathematics", pp. 312 324, Chapter 11, by David Wells. (optional)
  - h) "Mathematics and the real world" by R. Rajaraman
  - i) "The unreasonable Effectiveness of Mathematics in the Natural Sciences" by Eugene Wigner
  - j) The Three Crises in Mathematics: Logicism, Intuitionism and Formalism

Tutor: Mr Jarrod Lee

### **KI Essay Questions**

Use these essay questions to guide you in your study of Mathematics as an area of knowledge in KI.

- 1. 'Mathematics involves reducing the complex to the simple, but it does not add anything new to our knowledge of the world.' Discuss. (2008 A levels)
- 2. Critically assess the view that Mathematics is the most important discipline. (2012 A Levels)
- 3. How significant are the differences between knowledge claims in Mathematics and Aesthetics? (2015 A Levels)
- 4. Critically assess the claim that although we may know mathematical propositions with certainty, they do not amount to knowledge of the real world. (2016 A Levels)
- 5. '*Mathematics is a matter of invention not discovery.'* Critically assess this view. (2018 A Levels)
- 6. 'Mathematical truths are true before they are known to be true.' Critically assess this view. (2021 A Levels)
- 'The pursuit of knowledge should know no bounds if progress is to be achieved.' Discuss this view using illustrations from at least two different fields of knowledge to support your ideas. (Section A)
- 8. To what extent is knowledge in aesthetics and mathematics similar? (Section B)
- 9. 'Mathematical knowledge is absolute, while Scientific knowledge is constantly in a state of flux.' How far do you agree with this statement? (Section B)
- 10. 'Unlike Science, we do not need to limit our pursuit of Mathematical knowledge.' Discuss. (Section B)
- 11. Compare the roles played by reasoning in Mathematics and Science. (Section B)
- 12. How far does Mathematics help us to know what is beautiful? (Section B)
- 13. 'Mathematics is more reliable than Science.' Discuss. (Section B)
- 14. 'Mathematics is divorced from human experience.' Discuss. (Section B)
- 15. Compare and contrast the nature of evidence in two different fields of knowledge. (2008 A Levels Section A)
- 16. Can we know something that has not yet been proven true? (Section A)
- 17. Can Mathematics 'tell the truth' better than other areas of knowledge? (Section B)
- 18. Compare the roles played by reason and imagination in at least two areas of knowledge. (Section A)

#### BWT-July2006, modified JTKK- August2007, updated JJL – July 2023