

1. Read Burton §3.3-3.5 and you are given permission to do so **lightly**.

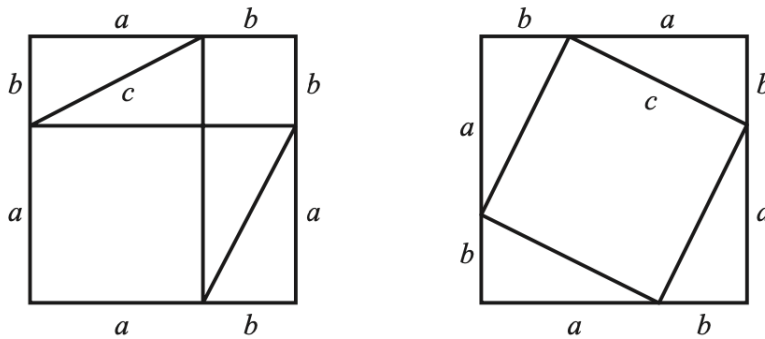
In section 3.3, our focus will be on (i) geometric proofs of the Pythagorean Theorem, (ii) the word **incommensurable**, and (iii) what is meant by the **crisis of incommensurable quantities**.

In Section 3.4, our focus is on (i) what counts as a **geometric construction**, (ii) what are the three construction problems of antiquity, which requires knowing the word **quadrature**. In class, we will show Hippocrates' quadrature of the lune.

In Section 3.5, our focus is on the curve called a **quadratrix**, its definition and its uses.

Section 3.3 Questions

2. Supposing that the triangle with sides  $a$ ,  $b$  and  $c$  is a right triangle, explain how the pictures below "prove" that  $a^2 + b^2 = c^2$ . What facts from geometry are being **implicitly** used in these pictures/arguments?



3. (pg 109) What does it mean for two line segments to be **commensurable**? What does it mean for two line segments to be **incommensurable**? (Note that in neither case are you allowed to use the words rational or irrational.)

4. In one sentence, what was the **crisis of incommensurable quantities**?

5. Using modern terminology and in one sentence, why is this a **crisis**?

Section 3.4 Questions

6. What do ancient Greek mathematicians mean by a **geometric construction**? (pg 121)
  
  
  
  
  
  
  
  
  
  
7. Restate in modern language the **quadrature of the circle** problem.
  
  
  
  
  
  
  
  
  
  
8. What does the author mean by the **three construction problems of antiquity**? Why does he devote an entire section to them?

Section 3.5 Questions

9. How is the curve called a **quadratrix** defined?
  
  
  
  
  
  
  
  
  
  
10. Why is the curve important?