Quiz 2 for Section 3

History of Mathematics

UCR Math-153-03, Spring 2019

1. Find two examples of positive rational numbers x such that x^2+3x is the square of a rational number. (HINT: Write $x^2+3x=(x+d)^2$ and use this to find candidates for x.)

   Taking the hint to heart, suppose that x^2+Cx can be written as a square in the form of $(x+d)^2$ for some $d \in \mathbf{Q}$. Then

   $$\begin{aligned} x^2+Cx &= (x+d)^2 \\ x^2+Cx &= x^2+2dx+d^2 \\ Cx-2dx &= d^2 \\ x &= \frac{d^2}{C-2d}. \end{aligned}$$

   The problem stipulates that x be positive, so we have to be careful to choose $d \in \mathbf{Q}$ such that $C>2d$, but any such choice of d will give us an appropriate x.

Quiz 2 for Section 2

History of Mathematics

UCR Math-153-03, Spring 2019

1. Find two examples of positive rational numbers x such that x^2+5x is the square of a rational number. (HINT: Write $x^2+5x=(x+d)^2$ and use this to find candidates for x.)

   A general solution to this question is on the previous page.