Needham, Chapter 1, Exercise 14, p. 47.
G. Palmer, January 9, 2020, 10:30 am PST

14 By considering the product (2 + i) (3 + i), show that

$$\frac{\pi}{4} = tan^{-1}\,\frac{1}{2} + tan^{-1}\,\frac{1}{3}$$

The argument of a complex number is arctan(y/x). [I am switching notation because the *Mathematica* editor does not do well with the superscript notation.]

arg(2+i) = arctan(1/2)

arg(3+i) = arctan(1/3)

Multiplication of complex numbers requires adding the arguments.

arg((2+i)(3+i) = arg(5+5i) = arctan(1/2) + arctan(1/3)

π/4 = arctan(1/2) + tan(1/3)

This is what we wanted.