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The Chinese Remainder Theorem and knitting stitch patterns.

The Chinese Remainder Theorem (CRT) is a classical result in number theory on the existence of solutions to systems of linear congruences. Many number theory textbooks present applications of the CRT that are either classical riddle problems or problems involving denominations of money. Interestingly, it turns out that the CRT can also be used to combine stitch patterns in knitting. The common knitting terminology used in stitch dictionaries can be rephrased as expressions in modular arithmetic. By constructing a system of linear congruence equations and using the CRT to solve them, a knitter can find the correct number of stitches to cast on to combine a variety of stitch patterns. This application can be interesting to number theory students who are looking for an example beyond the typical ones. In addition, we will discuss how to modify the problem when the congruence equations don't perfectly satisfy the hypotheses of the CRT, as well as ways in which the flexibility of real-world knitting does not exactly fit the world of number theory. (Received September 16, 2013)