

MATH 5200 6.0 Problem Solving 2002-03

Assignment 5 - due December 9, 2002

1. In how many ways can a positive whole number be expressed as a sum of (two or more) consecutive positive whole numbers? For example, 13 can be expressed as $6+7$, while 15 can be expressed as $4+5+6$ and also as $7+8$. (See the problems “Consecutive Sums” (p. 68-76) and “More Consecutive Sums” (p. 182) in Mason et al, *Thinking Mathematically*.)
2. (Mason et al, p. 195) “Sum of squares”) Notice that

$$2^2 + 3^2 + 6^2 = 7^2$$

$$3^2 + 4^2 + 12^2 = 13^2$$

$$4^2 + 5^2 + 20^2 = 21^2$$

Is this part of a general pattern? Notice also that

$$3^2 + 4^2 = 5^2$$

$$10^2 + 11^2 + 12^2 = 13^2 + 14^2$$

$$21^2 + 22^2 + 23^2 + 24^2 = 25^2 + 26^2 + 27^2$$

Is this part of a general pattern?

Describe how you approached the problems including unsuccessful attempts. In what ways could this problem be useful in teaching mathematics?