

Name: _____

Sums of squares.

The Problem.

A **square number** is a whole number multiplied by itself. For instance, nine is square because $9 = 3 \times 3$. Here is a list of some square numbers:

0, 1, 4, 9, 16, 25, 36, 49, ...

It is a surprising fact that **every whole number is the sum of four squares**. For example:

$$10 = 4 + 4 + 1 + 1$$

$$11 = 9 + 1 + 1 + 0$$

$$12 = 9 + 1 + 1 + 1$$

$$13 = 9 + 4 + 0 + 0$$

$$14 = 9 + 4 + 1 + 0$$

Write the numbers 15, 16, 17, 18, 19, 20, 21, and 22 as the sum of four squares. Can every number be written as the sum of **three** squares?

Your solution.