**A**nother very low-key arithmetic problem as [Le Monde current mathematical puzzle](https://xianblog.wordpress.com/2011/09/03/le-monde-puzzle-website/):

*32761 is 181² and the difference of two cubes, which ones? And 181=9²+10², the sum of two consecutive integers. Is this a general rule, i.e. the root z of a perfect square that is the difference of two cubes is always the sum of two consecutive integers squared?*

The solution proceeds by a very dumb R search of cubes, leading to

34761=105³-104³

The general rule can be failed by a single counter-example. Running

sol=0;while(!sol){

x=sample(2:1e3,1)

y=sample(1:x,1)-1

sol=is.sqr(z<-x^3-y^3)

z=round(sqrt(z))

if (sol)

sol=(trunc(sqrt(z/2))^2+ceiling(sqrt(z/2))^2!=z)}

which is based on the fact that, if z is the sum of two consecutive integers squared, a² and (a+1)² then

2 a²

Running the R code produces

x=14, y=7

as a counter-example. (Note that, however, [if the difference of cubes of two consecutive integers is a square, then this square can be written as the sum of the squares of two different integers](https://math.stackexchange.com/q/426485/14893).) Reading the solution in the following issue led me to realised I had missed the consecutive in the statement of the puzzle!