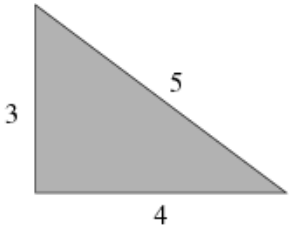
Problem A: Pythagoras's Revenge

Source file: `revenge.{c, cpp, java}`
Input file: `revenge.in`

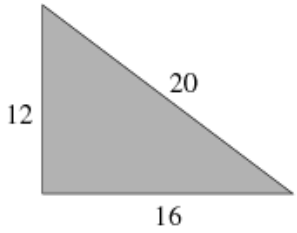
The famous Pythagorean theorem states that a right triangle, having side lengths *A* and *B* and hypotenuse length *C*, satisfies the formula

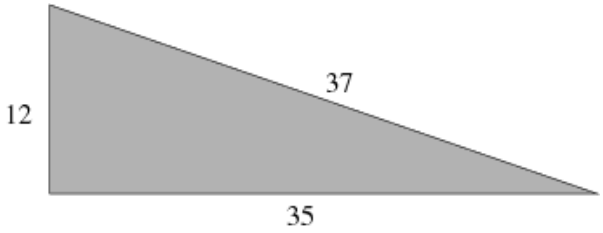
$$A^2 + B^2 = C^2$$

It is also well known that there exist some right triangles in which all three side lengths are integral, such as the classic:



Further examples, both having *A*=12, are the following:





The question of the day is, given a fixed integer value for *A*, how many distinct integers $B > A$ exist such that the hypotenuse length *C* is integral?

Input: Each line contains a single integer *A*, such that $2 \le A < 1048576 = 2^{20}$. The end of the input is designated by a line containing the value 0.

Output: For each value of *A*, output the number of integers $B > A$ such that a right triangle having side lengths *A* and *B* has a hypotenuse with integral length.

Example input:	Example output:
3 12 2 1048574 1048575 0	1 2 0 1 175

A Hint and a Warning: Our hint is that you need not consider any value for *B* that is greater than $(A^2-1)/2$, because for any such right triangle, hypotenuse C satisfies $B < C < B + 1$, and thus cannot have integral length.

Our warning is that for values of $A \approx 2^{20}$, there could be solutions with $B \approx 2^{39}$, and thus values of $C^2 > B^2 \approx 2^{78}$.

You can guarantee yourself 64-bit integer calculations by using the type **`long long`** in C++ or **`long`** in Java. But neither of those types will allow you to accurately calculate the value of C^2 for such an extreme case. (Which is, after all, what makes this **Pythagoras's *revenge***!)