

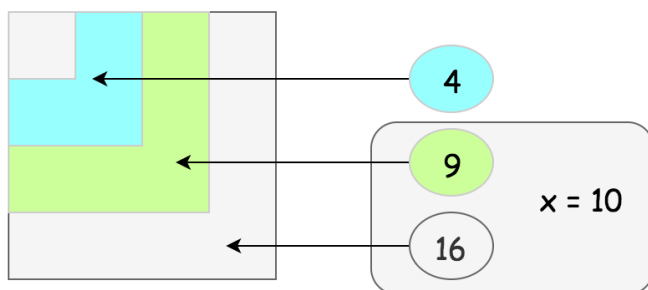
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# Solution

## Integer Square Root

The value  $a$  we're supposed to compute could be defined as  $a^2 \leq x < (a + 1)^2$ . It is called *integer square root*. From geometrical points of view, it's the side of the largest integer-side square with a surface less than  $x$ .



## Approach 1: Pocket Calculator Algorithm

Before going to the serious stuff, let's first have some fun and implement the [algorithm used by the pocket calculators](#).

Usually a pocket calculator computes well exponential functions and natural logarithms by having logarithm tables hardcoded or by the other means. Hence the idea is to reduce the square root computation to these two algorithms as well

$$\sqrt{x} = e^{\frac{1}{2} \log x}$$

```

1      public cla
2      {
3          public
4          {
5              if
6              ir
7              ir
8
9              wr
10         {
11
12         right) / 2; //
13
14         (long) mid * n
15
16         1;
17         squireVal)
18         1;
19
20         }
21     }

```

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