Given a non-negative integer x, return the square root of x rounded down to the nearest integer. The returned integer should be non-negative as well. You must not use any built-in exponent function or operator.

Example 1:
Input: x = 4 **Output:** 2 **Explanation:** The square root of 4 is 2, so we return 2.

Example 2:
Input: x = 8 **Output:** 2 **Explanation:** The square root of 8 is 2.82842..., and since we round it down to the nearest integer, 2 is returned.

Constraints:
0 <= x <= 2^31 - 1

Solution

```
def square_rt(x):
    if x == 0:
        return 0

    left, right = 1, x
    while left <= right:
        mid = (left + right) // 2
        if mid * mid == x:
            return mid
        elif mid * mid < x:
            left = mid + 1
        else:
            right = mid - 1

    return right
```