

# Building A Fence

*Jeffrey Wang, 2007*

*Points: 250*

Industrious Farmer John wants to build a four-sided fence to enclose the cows. He has one plank of wood of integer length  $N$  ( $4 \leq N \leq 2,500$ ) that he wants to cut at three points to make four integer-length pieces.

The four pieces can be of any positive integer length as long as Farmer John can form a quadrilateral fence with them. How many different ways can he cut the plank of wood so that he can make a complete fence?

## Notes

- Two ways of cutting are different if one has a cut at a spot that the other doesn't. Don't worry about eliminating symmetries or other complexities like that.
- Do make sure, though, that the fence has greater than 0 area.
- Rejoice that the answer will always fit into a signed 32-bit integer.

## Input

- Line 1: A single integer:  $N$

## Output

- Line 1: A single integer that is the number of ways that Farmer John can cut the plank of wood into four pieces such that they form a valid quadrilateral.

## Example

**Input:**

6

**Output:**

6

## Input details

The plank of wood has length 6.

## Output details

Farmer John can cut the plank 10 ways into four pieces: (1, 1, 1, 3); (1, 1, 2, 2); (1, 1, 3, 1); (1, 2, 1, 2); (1, 2, 2, 1); (1, 3, 1, 1); (2, 1, 1, 2); (2, 1, 2, 1); (2, 2, 1, 1); or (3, 1, 1, 1). Four of these -- (1, 1, 1, 3), (1, 1, 3, 1), (1, 3, 1, 1), and (3, 1, 1, 1) -- cannot be used to form a quadrilateral, though.