

1. What does this recursive function do?

Consider the following recursive function:

```
def power_of_two(k):  
    if k == 0:  
        return 1  
  
    return 2 * power_of_two(k - 1)
```

- Circle the base case in the code.
- What value does `power_of_two(0)` return? _____
- What value does `power_of_two(1)` return? _____
- What value does `power_of_two(2)` return? _____
- What value does `power_of_two(3)` return? _____
- In your own words, what does this function compute?

2. Fill out `product_to_n`

The function `product_to_n(n)` returns the product of all integers from 1 to n , including n .

- What should `product_to_n(1)` return?

`product_to_n(1)` = _____

- What should `product_to_n(4)` return?

`product_to_n(4)` = $1 \cdot 2 \cdot 3 \cdot 4$ = _____

- What should `product_to_n(5)` return?

`product_to_n(5)` = $1 \cdot 2 \cdot 3 \cdot 4 \cdot 5$ = _____

d. If you already know `product_to_n(n - 1)`, what do you need to multiply by to get `product_to_n(n)`?

`product_to_n(n) = _____ · product_to_n(n - 1)`

e. Fill out the function for `product_to_n`.

```
def product_to_n(n):  
    if _____:  
        return _____  
  
    return _____
```