

Experiment ‘P_2_3_powerFunctions’ Results

December 18, 2025

Experiment outcome: SUCCESS

Bad responses: 0

Responses containing assume : 0

Resolution attempts: 1

Hard fails (resolution): 0

Soft fails (resolution): 0

Verification attempts: 1

Problem Specification

Problem name: P_2_3_powerFunctions

Natural language statement: Write a method that takes a number and returns its square, cube, and fourth power.

Method signature: power_functions(x: int) returns (sq: int, cube : int, fourth: int)

Ensures

- $\text{sq} == \text{x} * \text{x}$
- $\text{cube} == \text{x} * \text{x} * \text{x}$
- $\text{fourth} == \text{x} * \text{x} * \text{x} * \text{x}$

GenAI interactions

Below you will find all interactions between the ‘user’ (program) and the ‘assistant’ (OpenAI).

Program → GenAI

You are given the following task to perform in Dafny:

Write a method that takes a number and returns its square, cube, and fourth power.

The signature should be:

```
method power_functions(x: int) returns (sq: int, cube : int, fourth: int)
```

The method should respect the following contract:

```
ensures sq == x * x, ensures cube == x * x * x, ensures fourth == x * x * x * x
```

Produce and show only the Dafny body of this method, including the curly braces that

→ surround it. Do not show the signature nor contract. You must not use 'assume'

→ anywhere in your code.

GenAI → Program

System fingerprint:

ID: chatcmpl-Co4OxJ0KZHNUX9G3qfJ2SYClpYVgI

Model: gpt-5.1-chat-latest

Created at: 1766049355

Finish reason: stop

Usage: 302 tokens in, and 50 tokens out

```
{
    sq := x * x;
    cube := x * x * x;
    fourth := x * x * x * x;
}
```

Final Program

```
method power_functions(x: int) returns (sq: int, cube : int, fourth: int)
    ensures sq == x * x
    ensures cube == x * x * x
    ensures fourth == x * x * x * x
{
    sq := x * x;
    cube := x * x * x;
    fourth := x * x * x * x;
}
```

Total Token Usage

Input tokens: 302

Output tokens: 50

Reasoning tokens: 0

Sum of ‘total tokens’: 352

Experiment Timings

Overall Experiment started at 1766049357586, ended at 1766049360178, lasting 2592ms (2.59 seconds)

Iteration #1 started at 1766049357586, ended at 1766049360178, lasting 2592ms (2.59 seconds)