

# N-CN Complex Cube and Fourth Roots of 1

## Task

For each odd positive integer  $n$ , the only real number solution to  $x^n = 1$  is  $x = 1$  while for even positive integers  $n$ ,  $x = 1$  and  $x = -1$  are solutions to  $x^n = 1$ . In this problem we look for all complex number solutions to  $x^n = 1$  for some small values of  $n$ .

- a. Find all complex numbers  $a + bi$  whose cube is 1.
- b. Find all complex numbers  $a + bi$  whose fourth power is 1.



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