Math 231. Honors Question 5.

The complex numbers revisited

1. Find all complex numbers $z = x + iy$ for which $z^6 = 1$. First write them in the form $z = re^{i\theta}$, then in the form $x + iy$ with $x$ and $y$ numbers (some of which will involve square roots). There are exactly 6 such numbers (you don’t need to prove this).

2. Plot these numbers in the complex plane.

3. For any positive integer $n$, can you guess what the set of complex numbers satisfying the equation $z^n = 1$ looks like in the complex plane?