1.3 Challenge Problems
Honors Algebra 2 with Trig

1. NCTM May 2019 #7
   For what values of a will the roots of the equation $x^2 - 2x + (a^2 - 3) = 0$ be imaginary?

2. NCTM May 2019 #17
   For what values of a will the roots of the equation
   $$(2a + 1)x^2 - (4a + 2)x + (2a - 1) = 0$$
   be imaginary?

3. NCTM Sept 2018 #8
   Find two numbers a and b such that $a = b^2$ and $b = a^2$ but $a \neq b$.

4. NCTM Sept 2018 #3
   Given that $i = \sqrt{-1}$, solve for x:
   $$(x + i)(x - i) = 10$$

5. NCTM Sept 2018 #18
   There are 3 complex numbers that one can cube to get the number 8. Find all 3.

6. NCTM May 2016 #15
   Let $f(x) = x^2$ where $x = a + bi$, $i = \sqrt{-1}$, and a and b are real numbers. Compute
   $$f(3 + 4i)$$