ALGEBRA 2 HONORS
PROBLEM SET 16

DUE DATE: NOVEMBER 6, 2023

Recall that we use the symbol $i = \sqrt{-1}$ with the understanding that $i^2 = -1$.

Question 1. Simplify each of the following in to $a + bi$ form.

(a) $(1 + i)^2$

(b) $(2i - 2) - (-1 + i)$

(c) $(2 + i)(3 + i)$

(d) $\dfrac{2 + i}{3 - i}$

Question 2. Assuming that x and y are real numbers, solve for x and y in each equation:

(a) $x + yi = 3i - 4$

(b) $x + yi = -7 + 2i$

(c) $x + yi = 0$

(d) $x + yi = (1 - i)^2$

(e) $(x + yi)^2 = 2i$

(f) $(x + yi)(2 - i) = 8 + i$

Question 3. Solve for all x that satisfy the equation (real or complex)

(a) $x^2 - 10x + 29 = 0$

(b) $22x^2 + 5 = 6x$

(c) $x^2 + 14x + 50 = 0$

(d) $2x^2 + 9 = 0$

Question 4. Let $f(x) = 3x^2 + 2ix + i$. Compute $f(2 + i)$