Name: _____

MATH 101
Spring 2024
HW 5: Due 02/07

"I don't wanna have to bring this up. . . But it's my turn to take a selfish."
— David Rose, Schitt's Creek

Problem 1. (10pts) Express each of the following decimal numbers as a rational number in simplest form and express each of the rational numbers as a decimal number:

(a) $\frac{1}{11}$

(b) 1.12

(c) $\frac{71}{5}$

Problem 2. (10pts) Showing all your work, express the number $0.\overline{123}$ as a rational number.

Problem 3. (10pts) Perform the following operations in $\mathbb{C}$:

(a) $(6 - 8i) + (4 + 2i)$

(b) $(13 - i) - (15 - 8i)$

(c) $(5 + i)(6 - 2i)$

(d) $\dfrac{1 + 2i}{3 + i}$

Problem 4. (10pts) Every quadratic equation $ax^2 + bx + c = 0$ has exactly two (not necessarily distinct) solutions when the solutions are allowed to be complex numbers. For instance, the equation $2x^2 - 20x + 68 = 0$ has as its solutions $5 \pm 3i$. Verify that $5 - 3i$ is a solution to this equation.