

Name: \_\_\_\_\_

MATH 101

Spring 2024

HW 18: Due 04/17

*“If you don’t learn from your mistakes, there’s  
no sense making them.”*

— Herbert V. Prochnow

**Problem 1.** (10pts) Without explicitly solving the quadratic equation, determine whether how many distinct solutions the equation has and whether the solutions are rational, real, or complex. Be sure to justify your answer.

$$x^2 = 36 - 5x$$

**Problem 2.** (10pts) Without explicitly factoring the function  $f(x) = x^2 - 8x + 5$  factors 'nicely' over the integers, reals, or complex numbers. Be sure to justify your answer.

**Problem 3.** (10pts) Find the roots for the function  $f(x) = 2x^2 - 7x + 1$ . Solve the following quadratic equation. Be sure to fully justify your answer and show all your work.

**Problem 4.** (10pts) Solve the following equation. Be sure to fully justify your answer and show all your work.

$$x(x + 1) = -3$$