Name:

Collaborators:

Instructions: Worksheets are graded mostly on completion, and partially on correctness. Please write complete solutions showing explanations and key steps to the following problems, unless it says otherwise.

Review Algebra

1. Linear Systems of Two Variables

For the following systems of two equations, use the Method of Substitution to find the solution or to determine if the system is inconsistent or dependent.

a.
$$\begin{aligned} 2x + y &= 10 \\ 3x - 2y &= 5 \end{aligned}$$

b.
$$\begin{aligned} x - 3y &= 7 \\ -2x + 6y &= 4 \end{aligned}$$

2. Roots of Polynomials

For the following functions, list all of the zeros of the polynomial and give their multiplicities.

a. $f(x) = x^2 + 2x - 120$

b. $g(x) = 4x^3 + x^2 - 3x$

c. $h(x) = (x-1)^2(x+8)(x-2)$

3. Partial Fractions

Express the rational function $f(x) = \dfrac{2x^3 + 3x^2 + 4x + 5}{(x-1)^2(x^2+1)}$ as a sum of partial fractions.

4. Long Division

Use the method of long division to perform the indicated division.

a. Divide $8x^4 + x^3 - 3x^2 + 1$ by $x^2 - 2$.

b. Divide $8x^3 - 4x + 1$ by $x + 6$.