Algebra II
Dr. Paul L. Bailey

Homework 1115
Monday, November 15, 2021

Name:

Due Tuesday, November 16, 2021. Write all complex numbers and polynomials in standard form.

Definition 1. Let f be a polynomial and let a be a number. The *multiplicity* of a as a zero of f is the largest n such that $(x-a)^n$ divides f.

Problem 1. Consider the polynomial $f(x) = (x-1)(x+7)^2(x-2)^3(3x-2)(x+8)$. Find the multiplicity the following numbers.

Number	1	2	7	-7	3/2	2/3
Multiplicity						

Problem 2. Respond to the following prompts.

(a) Find two numbers whose product is 30 and whose sum is 11.

(b) Factor $x^2 - 11x + 30$.

(c) Find two numbers whose product is 30 and whose difference is 7.

(d) Factor $x^2 - 7x - 30$.

Problem 3. Solve the following quadratic equations. Correctly write the solution set.

(a) $x^2 - 25 = 0$

(b) $x^2 - 10x + 25 = 0$

(c) $x^2 - 10x + 21 = 0$

(d) $x^2 - 10x - 24 = 0$

(e) $x^2 + 10x - 39 = 0$

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

Problem 4. Let $f(x) = 3x^2 - 17x + 10$. Suppose that $f(x)$ factors as $f(x) = (3x + p)(x + q)$. Find p and q.

Problem 5. Let $f(x) = x^3 - x^2 - 4x + 4$. Use the technique we called "Factor by Grouping" to completely factor f.

Problem 6. Let $f(x) = x^3 - 9x$. Factor f to find its zeros. Find the x- and y- intercepts of f. Sketch the graph of f.