ALGEBRA II
DR. PAUL L. BAILEY

Homework 1108
Monday, November 8, 2021

Name:

Due Tuesday, November 9, 2021. Write all complex numbers and polynomials in standard form.

**Problem 1.** Let $f(x) = x^2 - 8x + 15$. Draw a sign chart for $f$.

**Problem 2.** Let $f(x) = (x + 2)(x - 4)(x - 7)$.

**(a)** What is the $y$-intercept of $f$?

**(b)** What are the $x$-intercepts of $f$?

**(c)** Draw a sign chart for $f$.

**(d)** Use parts **(a)** through **(c)** to make a rough sketch of the graph of $f$.

**Problem 3.** Let $f(x) = x^2 - 3$ and $g(x) = x^4 - 2x^3 + 3x^2 - 4x + 5$.
Find the quotient and remainder when $g(x)$ is divided by $f(x)$.

**Problem 4.** Let $z = 5 + 2i$ and $w = 3 - 7i$.

**(a)** Compute $z + w$

**(b)** Compute $zw$

**(c)** Compute $z/w$

**Problem 5.** Let $f(x) = x^3 - 4x^2 - 11x + 30$.

**(a)** Show that $f(2) = 0$. Why does this show that $(x - 2)$ is a factor of $f$?

**(b)** Divide $f(x)$ by $(x - 2)$. Let $q(x)$ be the quotient, so $f(x) = (x - 2)q(x)$.

**(c)** Factor $q(x)$.

**(d)** Write the solution set to the equation $f(x) = 0$.