ALGEBRA II | PRACTICE Exam 6 | Name:
DR. PAUL L. BAILEY | Monday, January 10, 2022

The exam will contain ten problems worth ten points each. To study, *make sure you can do all of the problems on the previous exams and quizzes*, and on the current homework. This is the best way to know you are prepared.

Problem 1. Define natural numbers, integers, rational numbers, real numbers, and complex numbers. In each case, know the standard symbol for the set of all such numbers. In each case, be able to recognize whether a given number is in a given set.

Problem 2. Be able to graph a polynomial function and a rational function. Use worksheets 3 and 4 to practice these skills. You may check your work with a computer or graphing calculator, but do not use these until you have at least tried to do it yourself; otherwise, you will not learn.

Problem 3. Divide $x - 3$ into $x^3 - 3x^2 + 5x - 4$. Find the quotient and remainder.

Problem 4. Let $f(x) = x^5 + 3x^4 - 41x^3 + 11x^2 - 27x - 2$. Find $f(5)$.

Problem 5. Write the slope-intercept form ($y = mx + b$) of the equation of the line which passes through the points $(-2, -3)$ and $(3, 12)$.

Problem 6. Solve the equation $123x - 321 = 555x + 222$. Correctly write the solution set.

Problem 7. Solve the equation $x^3 = x^2 - x + 1$. Correctly write the solution set.

Problem 8. Solve the inequality $\dfrac{x^2 - 2x - 8}{x + 2} \geq 3$. Write the solution set using correct interval notation.

Problem 9. Find the domain and range of $f(x) = \dfrac{7x - 10}{3x + 9}$.

Problem 10. Let $A = [2, 8]$, $B = (5, 11)$, and $C = \{1, 3, 5\}$. Write the following sets, using correct set notation.

(a) $A \cup B$

(b) $A \cap B$

(c) $A \setminus B$

(d) $B \setminus A$

(e) $A \setminus C$