Name:

Algebra II
PRACTICE Examination 6

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Problem 1. (Finite Sets)
Let $A = \{3, 5, 7, 9, 11\}$.
Let $B = \{4, 5, 6, 7, 8\}$.
Compute the following sets in roster notation.

(a) $A \cup B$

(b) $A \cap B$

(c) $A \setminus B$

(d) $B \setminus A$

(e) $(A \cup B) \setminus (A \cap B)$

Problem 2. (Intervals)
Let $A = [7, 21]$.
Let $B = [5, 13)$.
Compute the following sets in interval notation.

(a) $A \cup B$

(b) $A \cap B$

(c) $A \setminus B$

(d) $B \setminus A$

(e) $(A \cup B) \setminus (A \cap B)$

Problem 3. (Linear Word Problem)
Bobby had \$ 21. On June 1 he got a job and worked every day for \$ 13 per day. On what date did he surpass \$ 100?

Problem 4. (Quadratic Word Problem)
A rectangle has a perimeter of 18 feet and an area of 20 square feet. Find the length, in feet, of the longer side.

Problem 5. (Solving Quadratic Equations with the Quadratic Formula)
Use the quadratic formula to find all complex solutions to the equation $2x^2 - 7x + 13 = 0$.
Simplify. Correctly write the solution set.

Problem 6. (Exponents)
Solve for x. Simplify.

(a) $x = 8^{2/3} + 625^{3/4}$

(b) $81^{2x+3} = 49^{x-4}$

Problem 7. (Equation of a Line)
Consider line through the points $A = (-3, 4)$ and $B = (3, -8)$.

(a) Find the point-slope form of the equation of the line.

(b) Find the y-intercept of the line.

(c) Find the x-intercepts of the line.

Problem 8. (Quadratic Functions)
Consider the function

$$f(x) = x^2 - 4x - 77.$$

The graph of f is a parabola.

(a) Find the y-intercept of the parabola.

(b) Find the x-intercepts of the parabola.

(c) Find the vertex of the parabola.

Problem 9. (Circle Intercepts)
Consider the circle centered at $(2, 5)$ of radius 3.

(a) Write the equation of the circle.

(b) Find the x-intercepts of the circle.

(c) Find the y-intercepts of the circle.

Problem 10. (Domain and Range)
Find the domain and range of the function $f(x) = x^2 - 14x + 17$. Write your answer using correct interval notation.