Algebra II | Activity 0109 | Name:
Dr. Paul L. Bailey | Monday, January 9, 2023

Problem 1. (Solving Radical Equations)
Solve the radical equation. Write the solution set.

(a) $\sqrt[3]{x^2 - 8x - 6} = 3$

(b) $\sqrt[5]{x^2 - 3x + 4} = 2$

(c) $\sqrt[4]{x^2 - x + 9} = 3$

Problem 2. (Solving Rational Equations)
Solve the rational equation. Write the solution set.

(a) $\dfrac{x-3}{x+5} = \dfrac{x+1}{x-7}$

(b) $\dfrac{x+3}{x-5} = \dfrac{2x+9}{x^2-9x+20}$

Problem 3. (Domain and Holes)
Let

$$f(x) = \frac{x^2 + 3x - 28}{x^2 - 9x + 20}.$$

State domain of f. Then, state its zeros, poles, and holes.

Problem 4. (Rational Inequalities)
Let

$$f(x) = \frac{x^2 + 3x - 28}{x^2 - 9x + 20}.$$

Draw a sign chart for $f(x)$. Then, solve the inequality $f(x) \geq 0$. State the solution set.

Problem 5. (Adding Rational Functions)
Let

$$f(x) = \frac{3}{x^2 + 3x - 28} \quad \text{and} \quad g(x) = \frac{x}{x^2 - 9x + 20}.$$

Find $f(x) + g(x)$. State your answer in "lowest form".