Write at top of first page of answer paper (a) name of school where you have studied, (b) number of weeks and recitations a week in elementary algebra. The minimum time requirement is five recitations a week for a school year.

Answer the first six questions and two of the others. Credit will not be granted unless all operations (except mental ones) necessary to find results are given; simply indicating the operations is not sufficient. Each answer should be reduced to its simplest form.

1. Solve and check or prove \( \frac{x}{3} - \frac{x-3}{3} = 12 - \frac{x+4}{2} - x \)

2. Extract the square root of \( 4c^4 - 4c^3 + 5c^2 - 2c + 1 \)

3. Solve \( \begin{cases} x + 2y = a \\ 2x - y = b \end{cases} \)

4. Simplify \( \sqrt{\frac{3}{4}} + \sqrt{\frac{1}{3}}; \ (\sqrt{5} - \sqrt{2})(2\sqrt{5} + 3\sqrt{2}) \)

5. In five years A will be twice as old as B; five years ago A was three times as old as B. Find the age of each at the present time.

6. Find the quotient to three terms and the remainder when \( 11a^3 - 5a + 12 - 82a^2 + 30a^4 \) is divided by \( 2a - 4 + 3a^2 \) [No partial credit will be granted on the answer to this question.]

7. a. What is the dividend which, divided by \( x \), gives a quotient of \( y \) and a remainder of \( z \)?

    b. If \( a \) apples are sold for a dime, how many can be bought for \( c \) cents?

8. Two men, A and B, can dig a trench in 20 days; it would take A 9 days longer to dig it alone than it would B. How long would it take B alone?

9. Find three successive even numbers whose sum is \( \frac{3}{8} \) of the product of the first two.

10. Simplify \( \frac{x^2 - \frac{1}{x}}{x + \frac{1}{x} + 1} \) [No partial credit will be granted on the answer to this question.]