The University of the State of New York
EXAMINATION FOR QUALIFYING CERTIFICATES

ELEMENTARY ALGEBRA

Monday, September 8, 1919—9.15 a.m. to 12.15 p.m., only

Answer question 1 and five 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. Papers entitled to less than 75 credits will not be accepted.

Fifty credits are assigned to question 1 and 10 credits to each of the others.

1. a. From \( h - 3k + m + n \) subtract the sum of \( 2h - k + m - n \) and \( h - 2k - m - 2n \)
   
   b. Multiply \( 2c^3 + c + 3 \) by \( c^3 - 2c - 2 \). Check.
   
   c. Divide \( m^4 + 6m^3 + 6m^2 - 12m - 16 \) by \( m^2 - 2 \)
   
   d. Factor \( 9m^2 - 12mn + 4n^2 \)
   
   e. \( 3x^3 - 5x - 12 \)
   
   f. \( 4a^3 - a \)
   
   g. \( a^3b - a^3 - ab + a \)

2. a. Reduce to lowest terms \( \frac{s^2 + 2s - 8}{s^2 - 8} \)

3. Simplify \( \frac{1}{n+4} - \frac{1}{n-1} - \frac{n-6}{n^2 + 3a - 4} \)

4. Simplify \( \frac{a^2b^3 + 3ab}{4a^2 - 1} \times \frac{a^2 - 3a + 2}{a^3 - ab + ab + 3} \)

5. Solve \( \frac{a+1}{a+x} = \frac{-1}{a-x} \)

6. Solve \( 12x^2 + 5x - 2 = 0 \)

7. Simplify \( \sqrt{81} + 2\sqrt{\frac{5}{16}} - \sqrt{192} + \sqrt{125} \)

8. a. Solve for \( t \) the equation \( S = \frac{1}{2} gt^2 \)

   b. Find the value of \( t \) when \( g = 32.16 \) feet, \( S = 787.92 \) feet.

9. If 6 pounds of sugar and 1 pound of coffee cost 98 cents and, at the same price, 2 pounds of coffee and 4 pounds of sugar cost $1.12, what is the price of each per pound?