The University of the State of New York

EXAMINATION FOR QUALIFYING CERTIFICATES

INTERMEDIATE ALGEBRA

Tuesday, September 11, 1917—9.15 a. m. to 12.15 p. m., only

Answer question 1 and seven of the others. Each answer should be reduced to its simplest form. Papers entitled to less than 75 credits will not be accepted.

1 Without solving the equations, discuss the nature of the roots of

$$x^2-4x+5=0$$

$$x+\frac{1}{x}=a+\frac{1}{a}$$

$$\frac{4}{x-1}-\frac{3}{x-2}=\frac{2}{x-3}-\frac{1}{x-4}$$

2 Simplify $(2\pm\sqrt{(-2)^3})-(-1\pm\sqrt{(-2)^4})$

3 The floor of a room contains 320 square feet; one end wall is 152 square feet and one side wall is 190 square feet. Find the dimensions of the room.

4 Factor the following:

$6x^4+2x^2y^2-8y^4$ $\qquad$ $3x^2+6xy-24y^2$

$6a^2+3ab+2ac+bc$ $\qquad$ $x^7+x^4-16x^3-16$

5 What two numbers whose sum is m are to each other as r is to s?

6 If the second, fourth and eighth terms of an arithmetic series are in geometric progression, find the numeric relation between the first term and the common difference.

7 Solve $\begin{cases} x^2-xy-12y^2=8 \\ x^2+xy-10y^2=20 \end{cases}$

8 Find the square root of

$$a^{-2}+9b^{\frac{4}{3}}+16c^{-\frac{1}{2}}+6a^{-1}b^{\frac{2}{3}}-8a^{-1}c^{-\frac{1}{4}}-24b^{\frac{2}{3}}c^{-\frac{1}{4}}$$

9 Find the values of the literal coefficients in the following equations:

$ax^2+3x-4=0$ if one root is 2

$x^2-5x+c=0$ if the difference of the roots is 3

10 For what value of k is one of the roots of the equation $(k-4)x^2-(2k-1)x=7-5k$ double the other?

11 Define polynomial, elimination, factor, coefficient.