New York State Education Department
208th High School Examination
Elementary Algebra

Monday, January 20, 1913—9.15 a. m. to 12.15 p. m., only

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. Factor each numerator and denominator in the following expressions; perform the operations indicated and reduce to simplest form:

\[
\frac{x^4 - 9x^3 - 36x^2}{x^2a^2 - 10x^2a + 9a^2} \times \frac{x^4 - 4x^2 + 3}{x^4 - 7x^2 - 18} \div \frac{x^3 + x^2}{a^2x^2 + 2a^2}
\]

[Credit will not be granted for the answer to this question if there is any error in the work.]

2. Solve \[\begin{align*}
\frac{x}{2} + \frac{y}{3} &= 4 \\
5x - 3y &= 2
\end{align*}\]

3. Solve \[x + \frac{a}{2} = \frac{a^2}{2x}\]

4. Simplify each of the following:

\[
4\sqrt{24} + 2\sqrt{54} - \sqrt{6} + 3\sqrt{96} - 5\sqrt{150}
\]

\[
\frac{3}{375}, \sqrt{\frac{2}{3}}, \sqrt[3]{\frac{1}{4}}, \frac{1}{\sqrt{3}}
\]

[Credit will not be granted for the answer to this question if there is any error in the work.]

5. Solve \[\begin{align*}
\frac{16x + 3}{10} - \frac{2x - 5}{5x - 1} &= \frac{8x - 1}{5}
\end{align*}\]

6. Separate 42 into two parts such that the greater part divided by the less shall give a quotient of 2 and a remainder of 3.

7. Solve \[\begin{align*}
6y^2 - xy &= 2x^2 \\
9y - 12 &= -4x
\end{align*}\]

8. What must be added to \(x + a\) to make \(y - b\)?

What is the cost of 3 apples if \(a\) apples cost \(c\) cents?

9. The sum of two numbers is 8 and the sum of their cubes is 152; find the numbers.

10. If 1 is added to the numerator of a fraction the value of the fraction becomes \(\frac{1}{2}\); if 1 is added to the denominator of the same fraction the value becomes \(\frac{1}{3}\). Find the fraction.