7. As in § 210, $p^{2n} + 4p^n - 1$, being relatively prime to p, must divide $(p^{3n} - 1)(p^{2n} - 1)$ and thus also $4p^n(p^{3n} - 1)$ and hence* $4(17p^n - 5)$ and hence divides

$$20(p^{2n} + 4p^n - 1) - (68p^n - 20) = p^n(20p^n + 12)$$

Hence $(p^n + 2)^2 - 5$ must divide 304, since

$$3(68p^n - 20) + 5(20p^n + 12) = 304p^n.$$

Thus $$p^n + 2 < 18 > \sqrt{309}.$$

But $p^n = 13, 11, 9, 5, 3$ are readily excluded; while $p^n = 7$ yields 76 a divisor of 304 and indeed of $(7^3 - 1)(7^2 - 1)$, but is excluded since -1 is a non-residue of 7.

8. With the hypothesis of Jordan § 211, that $a^2 + b^2 + c^2 = 0$, etc., we have $a^2 = b^2 = \cdots$. Hence $3a^2 = 3b^2 = \cdots = 0$ and $ma^2 = 1$. Thus either $a^2 = b^2 = \cdots = 1$ or $2a^2 = 2b^2 = \cdots = 1$, when $1 - a^2 = a^2 =$ square.

UNIVERSITY OF CALIFORNIA,
November 20, 1897.

WEBER'S ALGEBRA.

Lehrbuch der Algebra. By HEINRICH WEBER, Professor of Mathematics in the University of Strassburg. Braunschweig, Friedrich Vieweg und Sohn. 1895–96. 8vo. Vol. I., pp. 653; Vol. II., pp. 796.

For some years the need of a thoroughly modern text-book on algebra has been seriously felt. The great strides that algebra has taken during the last twenty-five years, in almost all directions, have made Serret's classical work more and more antiquated, while modern books like Petersen's and Carnoy's make no claims to give a large and comprehensive survey of the subject. The appearance of any book modelled on the same broad plan as Serret's Algèbre Supérieure would thus be greeted with a hearty welcome, but when written by such a master as Heinrich Weber, we greet it with expressions of sincerest joy and satisfaction.

As Weber himself tells us, he has cherished for years the plan of this great undertaking; but before deciding to execute it he has traversed in his university lectures many times this vast domain as a whole, and has treated various parts separately with greater detail. No wonder, then, that

* Jordan has $68p - 12$, thus losing the divisor 76.