as imaginaries whose product is real. Well-founded objection might be made to examples 9, 10, and 11 on page 212. They involve a principle of physics with which the first-year algebra student will quite certainly be unfamiliar. The force of this objection depends of course on the degree to which we wish to encourage the student to accept principles or facts on a merely plausible explanation, which is probably all that would ever be given in class. The authors have in a number of cases introduced principles quite beyond the province of the book to discuss and have then built problems on these principles. While this is a matter on which there may be room for argument, it is the reviewer's opinion that there is no such dearth of desirable material for problems for the first year's work in algebra that one need bring in totally strange ideas from physics and geometry in order to have plenty. The subject of graphs is emphasized to a degree that makes certain parts of the book resemble an intuitional analytic geometry. The proof that a straight line may be defined by an equation of the first degree is not too difficult for the student after a very brief study of plane geometry. Until he is prepared for some such proof would it not be wiser to let the graph alone? We feel that when the student is beginning a subject that is essentially logical, all unnecessary appeals to his intuition should be avoided.

J. V. McKELVEY.

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## CORRECTIONS.

ON page 66 of the current volume of the BULLETIN the writer gave the following theorem:

If on the interval $ab$

$$\sum_{n=0}^{\infty} U_n(x) = f(x),$$

$U_i(x)$ $(i = 0, \cdots, \infty)$ and $f(x)$ being continuous on the interval $ab$, then in order that $\sum_{n=0}^{\infty} U_n(x)$ shall be uniformly convergent on the interval $ab$ it is necessary and sufficient that for any $x_i$ on $ab$, any arbitrary number $\delta$ (however small), and any arbitrary integer $N$ there is an integer $N'(i, \delta, N)$ greater than $N$, which satisfies the following condition:

On the interval $x_i - \delta$, $x_i + \delta$ there is a value $x_i'$ of $x$ such that for every $N_i'' > N'(i, \delta, N)$

$$\left| \sum_{n=0}^{N'(i, \delta, N)} U_n(x_i') - f(x_i') \right| \geqq \left| \sum_{n=0}^{N_i''} U_n(x) - f(x) \right|$$

for every value of $x$ on the interval $x_i - \delta$, $x_i + \delta$ which also lies on $ab$.

In its present form this theorem is incorrect so far as it relates to a sufficient condition. The error consists in making $N_i$ depend on $\delta$. Instead we must require that an $N_i$ exists such that for any $\delta$ subsequently chosen the conditions given shall hold. In giving the proof of the sufficiency of the condition this is the form in which the hypothesis was used.

However the condition as modified is not necessary. Hence we have failed to obtain a necessary and sufficient condition. The theorem as stated in its original form gives a necessary condition, while the amended form gives a sufficient condition. Professor Osgood very kindly called the writer's attention to this error.

N. J. LENNES.

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IN my paper on "Invariant conditions that a $p$-ary form may have multiple linear factors" in the BULLETIN, volume 17, No. 9 (June, 1911) the condition $R_3 = 0$ in equations (7), page 455, should be replaced by $R_3' = 0$, where $R_3'$ is the resultant of $x_2^2\phi_{1x_1/x_2}$ and the greatest common divisor (linear) of $x_2^3\phi_{0x_1/x_2}$ and $x_2^2\phi_0'{}_{x_1/x_2}$.

O. E. GLENN.

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THE following typographical corrections should be made in my review of Holton's Shop Mathematics, in the December number of the BULLETIN:

Page 138, footnote. For Warnier read Warner.

Page 140. In the formulas $P_1 = \pi/P$, $P = 16$, $N = DP \cos Y$, for $P$ read $p$.

C. N. HASKINS.