$M$, a point $(x, y)$, distinct from $(x_1, y_1)$, such that 1) $|x - x_1| < \epsilon$, 2) $x - x_1 = 0$ and $|y - y_1| < \epsilon$, in case $y_1$ is distinct from 0 and from 1, 3) $x \leqq x_1$ if $y_1 = 0$, 4) $x \geqq x_1$ if $y_1 = 1$.

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# A PROBLEM IN THE KINEMATICS OF A RIGID BODY.

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THE problem of finding the acceleration of any point in a rigid body when the accelerations of three points are given, and incidentally of finding what is by this means determined regarding the velocities, has received but little attention. A theorem due to Burmeister solves the problem of finding the acceleration of any point in the plane of the three points whose accelerations are given. The theorem states: "If at four coplanar points $P_1$, $P_2$, $P_3$, $P_4$ the accelerations be drawn, their extremities lie in a plane and form a quadrilateral which is affine with the quadrilateral formed by the four points."

R. Mehmke* and J. Petersen† have considered the general case, but their results do not agree, owing to an oversight in Petersen's treatment. While their work is independent, the proof in both cases depends directly on the fact that when the distance between two points is constant the projections of their velocities on their joining line are equal and the projections of their accelerations on this line differ by $\omega^2 l$, $l$ being the distance between the two points and $\omega$ the angular velocity of the line. The purpose of this paper is to show that the problem can be solved very simply by using the expressions for the accelerations which are ordinarily given in text books on mechanics, and by this method the kinematical meaning of the solution is also evident.

Let there be given the accelerations at three points. It is proposed to find what can be determined regarding the kinematical state of the body at the given instant. As the acceleration at any point in the plane of the three points can be

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* Festschrift zur Feier des 50jährigen Bestehens der technischen Hochschule Darmstadt, page 77.

† Kinematik, page 46.