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AMERICAN MATHEMATICAL MONTHLY PROBLEM

11123. *Proposed by Christopher Hillar, Texas A&M University, College Station, TX, and Lionel Levine, University of California at Berkeley, Berkeley, CA.* Consider n unlabeled particles moving each at its own constant velocity along the real line. An observer is promised some number P of snapshots of the particles' positions, to be taken at uniformly spaced intervals of time. When particles coincide, the snapshot will show how many are at a given point.

(a) Show that if $P = n + 1$ then the observer can determine the velocities of each of the particles.

(b*) As a function of n , what is the minimum value of P that will suffice to ensure that the observer can determine all n velocities?