6. TWO BALLS

Let us consider the process in a free-falling frame of reference; them the both balls will move with constant velocities. The speeds are equal, but directions different; hence, for any moment of time, they are at equal distance from the throwing point Q. Thus, point Q can be found as the intersection point of the perpendicular bisector to the segment AB (connecting the balls), and the vertical line drawn from the point P.

In the lab frame, the point Q, however, is a free-falling point, and by time t has travelled distance $|PQ| = gt^2/2$. Using the provided scale we find from the figure that $|PQ| \approx 8.6\,\mathrm{m}$, hence $t = \sqrt{2|PQ|/g} \approx 1.3\,\mathrm{s}$. Hence, the throwing speed $v = |AQ|/t \approx 20\,\mathrm{m/s}$; here we have used reading from the figure, $|AQ| \approx 26\,\mathrm{m}$.

