

8.73 Set up an image system to compute the flow of a source at *unequal* distances from *two* walls, as shown in Fig. P8.73. Find the point of maximum velocity on the y -axis.

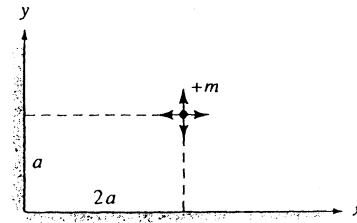
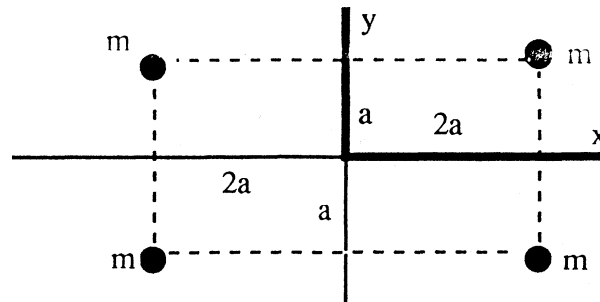


Fig. P8.73

Solution: Similar to Prob. 8.72 on the previous page, we place identical sources ($+m$) at the symmetric (but non-square) positions $(x, y) = (\pm 2a, \pm a)$ as shown below. The induced velocity along the wall ($x > 0, y = 0$) has the form

$$U = \frac{2m(x+2a)}{(x+2a)^2 + a^2} + \frac{2m(x-2a)}{(x-2a)^2 + a^2}$$



This velocity has a maximum (to the *right*) at $x \approx 2.93a$, $U \approx 1.387 m/a$. *Ans.*

8.74 A positive line vortex K is trapped in a corner, as in Fig. P8.74. Compute the total induced velocity at point B, $(x, y) = (2a, a)$, and compare with the induced velocity when no walls are present.

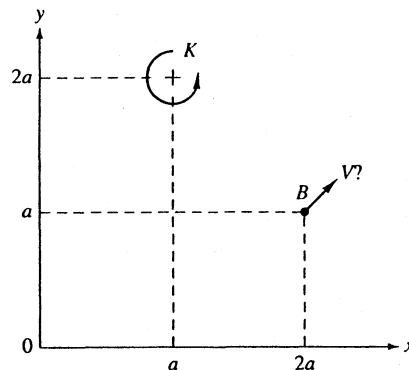


Fig. P8.74