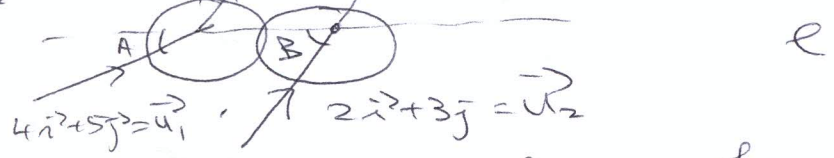


(A)  $v_1 = a\hat{i} + 5\hat{j}$   
 (B)  $v_2 = x\hat{i} + 3\hat{j}$



[JCPB unchanged because of smoothness]

$\tan A = \frac{5}{4}$        $\tan B = \frac{3}{2}$

PCM ( $\leftrightarrow$ ):  $(4)m + (2)m = ma + mx$   
 $\boxed{a + x = 6}$  (1)

NLR ( $\leftrightarrow$ ):  $x - a = -e(2 - 4)$   
 $\boxed{x - a = 2e}$  (2)

Solve (1) (2) Add  $\Rightarrow 2x = 6 + 2e$   
 $\Rightarrow \boxed{x = 3 + e}$

Also  $a + (3 + e) = 6$   
 $\Rightarrow \boxed{a = 3 - e}$

$\Rightarrow v_1 = (3 - e)\hat{i} + 5\hat{j}$        $v_2 = (3 + e)\hat{i} + 3\hat{j}$

$\tan \chi = \frac{5}{3 - e}$        $\tan \gamma = \frac{3}{3 + e}$

Angle of Deflection:



$\tan \phi = \frac{1}{4} \Rightarrow \phi = 14.04^\circ$   
 $\tan A = \frac{5}{4} \Rightarrow A = 51.04^\circ$   
 $\phi + A = 65.38^\circ$   
 $\Rightarrow \tan \chi = \tan 65.38 = 2.182$   
 $\Rightarrow 2.182 = \frac{5}{3 - e}$   
 $\Rightarrow \boxed{e = 0.7}$

OR

$$\begin{aligned} \tan \chi &= \tan(\phi + A) \\ &= \frac{\tan \phi + \tan A}{1 - \tan \phi \tan A} \\ &= \frac{\frac{1}{4} + \frac{5}{4}}{1 - \left(\frac{1}{4}\right)\left(\frac{5}{4}\right)} \\ &= \frac{\frac{3}{2}}{1 - \frac{5}{16}} = \frac{24}{11} = 2.182 \end{aligned}$$