Practice Work 1 – Collisions

Answers

1. Assuming both particles to move along the x-axis

   a) $\mathbf{v}_1' = -8,91\ \frac{\mathrm{m}}{\mathrm{s}}\,\hat{\mathbf{i}}$
   $\mathbf{v}_2' = 1,29\ \frac{\mathrm{m}}{\mathrm{s}}\,\hat{\mathbf{i}}$

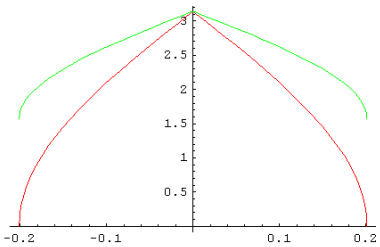
   b) $\mathbf{v}_1 = 5,15\ \frac{\mathrm{m}}{\mathrm{s}}\,\hat{\mathbf{i}}$

   c) $\mathbf{v}_2 = 4,76\ \frac{\mathrm{m}}{\mathrm{s}}\,\hat{\mathbf{i}}$

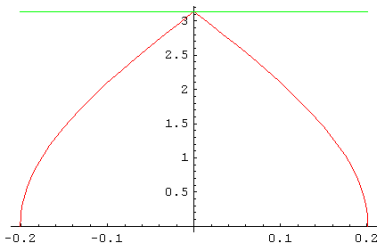
2. a) $\mathbf{v}_1' = -0,68\ \frac{\mathrm{m}}{\mathrm{s}}\,\hat{\mathbf{i}} + 0,83\ \frac{\mathrm{m}}{\mathrm{s}}\,\hat{\mathbf{j}}$
   $\mathbf{v}_2' = 1,37\ \frac{\mathrm{m}}{\mathrm{s}}\,\hat{\mathbf{i}} - 1,00\ \frac{\mathrm{m}}{\mathrm{s}}\,\hat{\mathbf{j}}$

   b) The function giving the angle between the velocities is plotted in the left figure below. The red curve is the angle between the initial and final velocities of particle A. The green curve is the angle between the final velocities of the particles.

   c) Same as (b) but the figure is on the right.



Answer for 2 b)



Answer for 2 c)