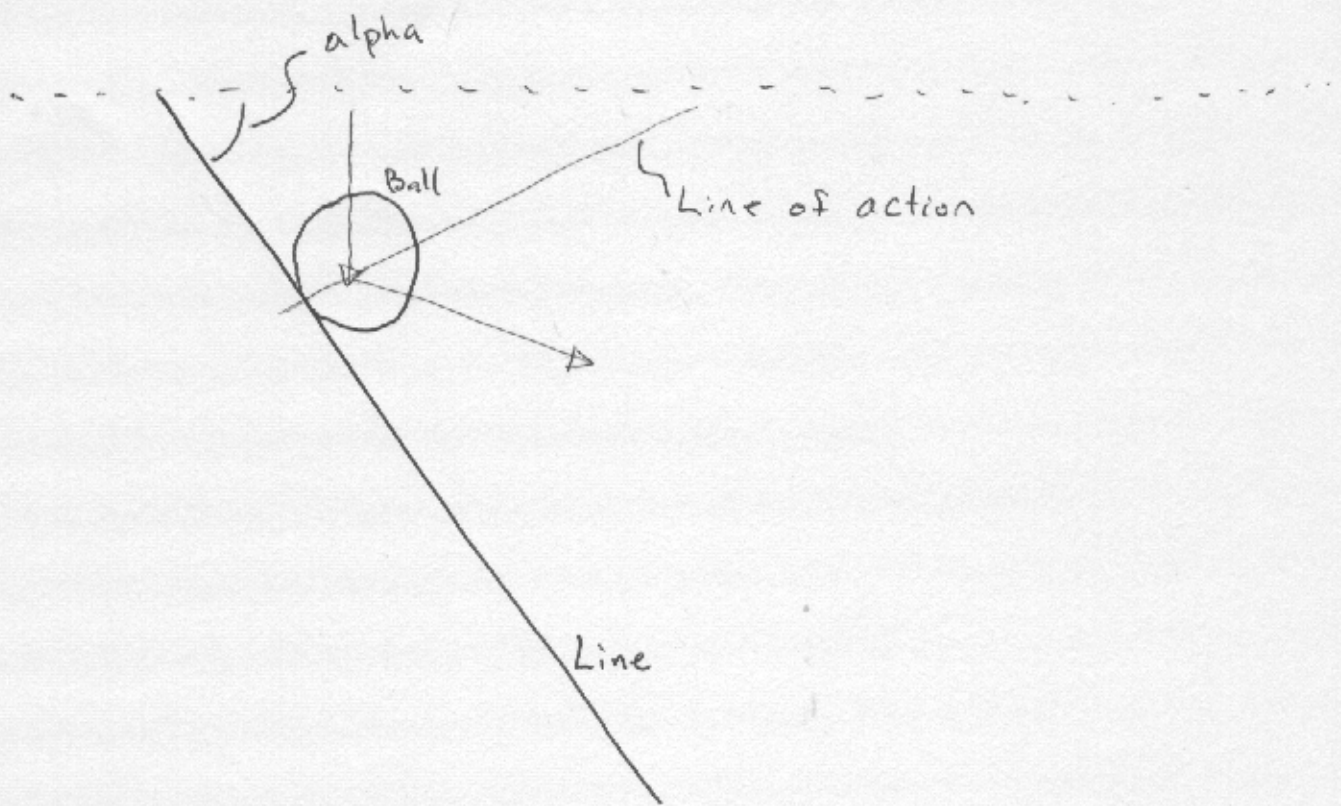


Ball-Line Reaction



ball

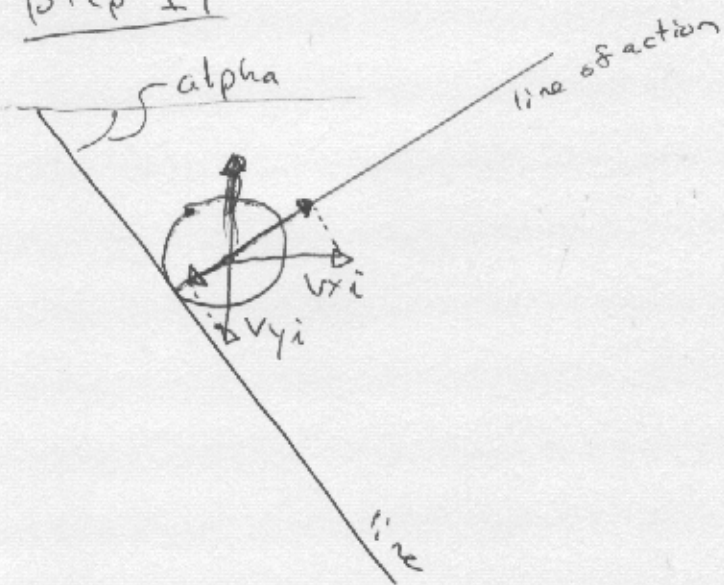
$$x_{mov} = v_{xi}$$

$$y_{mov} = v_{yi}$$

The "i" means initial

- 1.) project v_{xi} + v_{yi} ~~into~~ onto the line of action. Project v_{xi} + v_{yi} onto the line.
- 2.) Reverse the velocity along the line of action.
- 3.) Translate (project) back to the Flash ~~coordinate~~ x and y axes

Step 1



projection onto the line of action

$$v_{yi}' = v_{yi} \cdot \cos(\alpha) - v_{xi} \cdot \sin(\alpha)$$

This is affected in the collision, it's reversed.

projection onto the line

$$v_{xi}' = v_{xi} \cdot \cos(\alpha) + v_{yi} \cdot \sin(\alpha)$$

Step 2

$$v_{yf}' = -v_{yi}'$$
 "f" means final

$$v_{xf}' = v_{xi}'$$
 this is unchanged

Step 3

Project back to the x and y axes

$$v_{yf} = v_{yf}' \cdot \cos(\alpha) + v_{xf}' \cdot \sin(\alpha)$$

$$v_{xf} = v_{xf}' \cdot \cos(\alpha) - v_{yf}' \cdot \sin(\alpha)$$

Final velocities after the collision