technical proof

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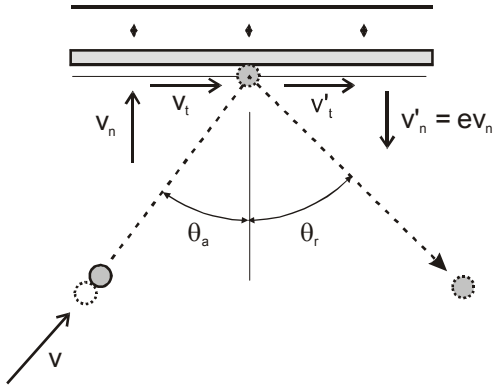
TP 6.3

Increase in bank rebound angle due to the rail coefficient of restitution

supporting:
"The Illustrated Principles of Pool and Billiards"
http://billiards.colostate.edu
by David G. Alciatore, PhD, PE ("Dr. Dave")



Neglecting friction,

$$v'_t = v_t$$

From the coefficient of restitution,

$$v'_n = e \cdot v_n$$

Approach angle:

$$\theta_a = \operatorname{atan}\left(\frac{v_t}{v_n}\right)$$

Rebound angle:

$$\theta_r = \operatorname{atan}\left(\frac{v'_t}{v'_n}\right)$$

Because e < 1,

$$v'_n < v_n \quad \text{and} \quad \theta_r > \theta_a$$