TP A.10
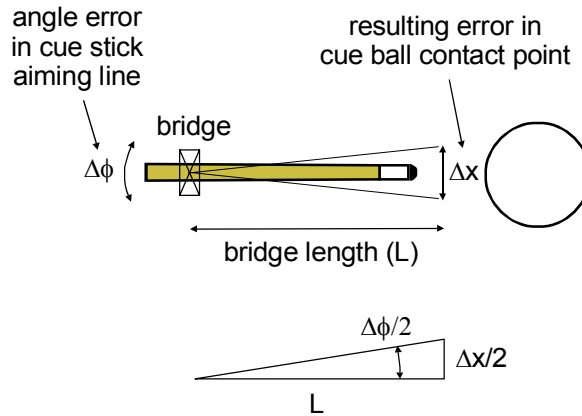## The effect of bridge length on contact point accuracy

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

From the triangle above, the possible error in the cue ball contact point depends on aiming line accuracy and bridge length according to:

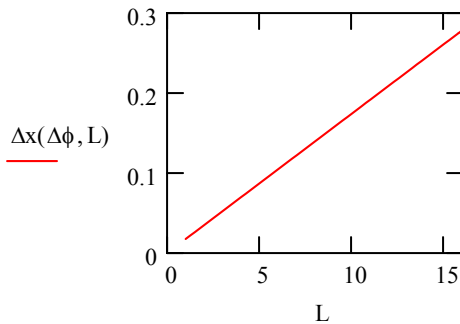$$\Delta x(\Delta\phi, L) := 2 \cdot L \cdot \tan\left(\frac{\Delta\phi}{2}\right)$$

Example values:

$\Delta\phi := 1 \cdot deg$ the error in the cue stick aiming line is 1 degree

$L := 1, 1.25 .. 16$ the bridge length is varied from 1 inch to 16 inches

In addition to the aiming line being off, the contact point error (Δx) can produce unwanted English resulting in deflection (squirt), throw, and curve.

$\Delta x(\Delta\phi, 6) = 0.105$ The contact point error is 1/10 inch for a stroke error of 1 degree at a bridge length of 6 inches.

$$\frac{\Delta x(\Delta\phi, 12)}{\Delta x(\Delta\phi, 6)} = 2$$ The contact point error doubles when the bridge length is doubled.