The computation on our page 65 (the top of page 94 in the French edition) of how far off-center the cueball may be struck without miscuing. This distance is given by that a satisfying the realtionship

$$\frac{5}{2}\frac{a^2}{R^2} = \left(1+\frac{M'}{M}\right)+$$

$$\left\{-\frac{\theta}{2}\left(1+\frac{M'}{M}\right)\sqrt{\frac{\theta^2}{4}\left(1+\frac{M'}{M}\right)^2+1-\theta\left(1+\frac{M}{M'}\right)}\right\}$$

This indeed follows from the equation

$$\left(1+\frac{M}{M'}\right)\sqrt{1-\theta-\theta\left(\frac{M'}{M}\right)\left(1+\frac{5}{2}\frac{a^2}{R^2}\right)}=\frac{5}{2}\frac{a^2}{R^2}$$

which is given as an inequality just before the previous equation above is asserted. I lost my way several times verifying this, so I thought that I'd write it up.

To see this, let $X = 1+\frac{5}{2}\frac{a^2}{R^2}$ and let $Q=\frac{M'}{M}$. Then, if we substitute in the latter equation and square both sides, we get

$$\left(1+Q^{-1}\right)^2(1-\theta-\theta Qx) = (x-1)^2 = x^2-2x+1, \text{ or}$$

$$x^2+\left[\theta Q\left(1+Q^{-1}\right)^2-2\right]x+\left[1-\left(1+Q^{-1}\right)^2(1-\theta)\right]=0$$

Applying the quadratic formula we have

$$x=-\frac{1}{2}\left[\theta Q\left(1+Q^{-1}\right)^2-2\right]$$

$$\pm\frac{1}{2}\sqrt{\theta^2Q^2\left(1+Q^{-1}\right)^4-4\theta Q\left(1+Q^{-1}\right)^2+4-4\left(1+Q^{-1}\right)^2(1-\theta)},$$

or

$$x=-\frac{1}{2}\left[\theta Q\left(1+Q^{-1}\right)^2-2\right]$$

$$\pm\frac{\left(1+Q^{-1}\right)}{2}\sqrt{\theta^2Q^2\left(1+Q^{-1}\right)^2-4\theta Q+-4(1-\theta)}$$

or

$$x-1=\left(1+Q^{-1}\right)\left[-\frac{\theta}{2}Q\left(1+Q^{-1}\right)+\sqrt{\frac{\theta^2}{4}(Q+1)^2-\theta Q+1}\right],$$

which becomes precisely the formula near the bottom of our page 65 (or on the top of page 94 in the original.)