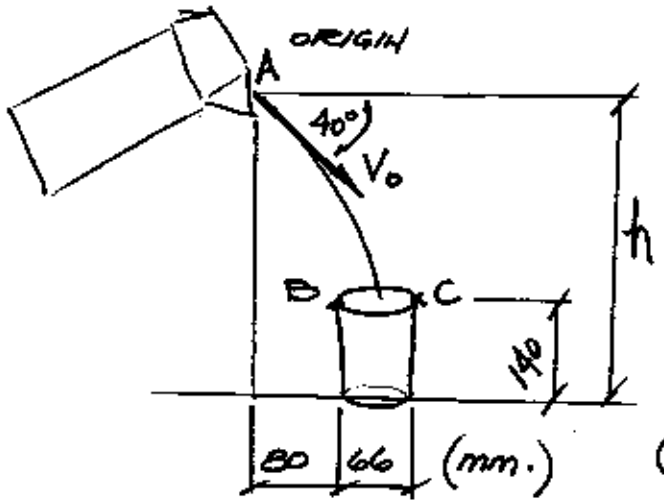
MECH 236
HOW TO POUR MILK!

PROB. 11.102
p. 635



$V_0 = 1.2 \frac{m}{s}$

$V_{0x} = 1.2 \cos 40° = 0.92 \frac{m}{s} \rightarrow$

$V_{0y} = 1.2 \sin 40° = 0.77 \frac{m}{s} \downarrow$

? RANGE of h FOR MILK TO ENTER GLASS.

$t_0 = 0 \quad x_0 = 0 \quad y_0 = 0$

HW by MILANO

HORIZ. $x_f = \cancel{x_0}^{\,0} + V_{0x} t + \frac{1}{2} \cancel{A_x}^{\,0} t^2$

VERT. $y_f = \cancel{y_0}^{\,0} + V_{0y} t + \frac{1}{2} A_y t^2 \qquad A_y = 9.81 \frac{m}{s^2} \downarrow$

Milk entering at B

$x_f = +.080\,m = \left(0.92 \frac{m}{s}\right) t \quad \therefore \underline{t = 0.087 \text{ sec.}}$

$y_f = -(h - .140) = -(.77 \frac{m}{s})(.087 \text{ sec}) + \frac{1}{2}(9.81 \frac{m}{s^2})(.087 \text{ sec})^2$

$-h = -.140 - \quad - \quad = -0.244$ $\boxed{h_B = 244\,mm}$

Milk entering at C

$x_f = +0.146\,m = (0.92 \frac{m}{s}) t \quad \therefore \underline{t = 0.1587 \text{ sec.}}$

$y_f = -(h - .140) = -(.77 \frac{m}{s})(0.1587 \text{ sec}) + \frac{1}{2}(-9.81 \frac{m}{s^2})(0.1587 \text{ sec})^2$

$-h = -.140 - \quad - \quad = -0.3857$

$\boxed{h_C = 385.7\,mm}$

The milk carton can be between
244 mm and 385.7 mm from the table
(9.6 in.) (15.185 in.)
seems reasonable.

Find WHEN, then the VELOCITY.