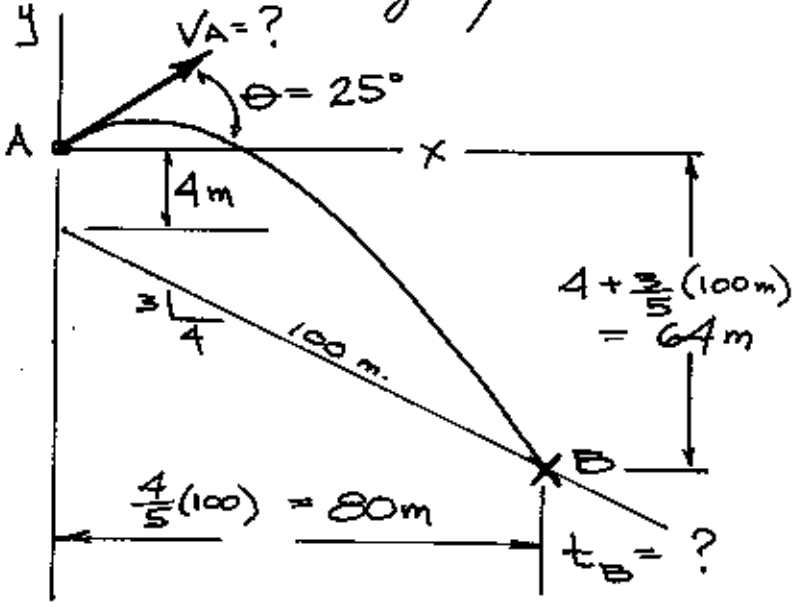
HIBBELER

PROB. 12-91

This one is slightly more challenging.



$\vec{a} = \cancel{a_x}^{0}\,\hat{i} + a_y\,\hat{j}$

where $a_y = -9.81\,\frac{m}{s^2}$

USE pt. A as ORIGIN.

USE X & Y COMPONENTS.

X components

$s_{Bx} = s_{Ax} + V_{Ax}t + \frac{1}{2}a_x t^2$

$80m = 0 + V_A \cos 25° t + 0$

$\frac{80}{\cos 25°} = \underbrace{V_A t = 88.27}$

sub. this relation

Y components

$s_{By} = s_{Ay} + V_{Ay}t + \frac{1}{2}a_y t^2$

$-64m = 0 + V_A \sin 25° t - \frac{9.81}{2}t^2$

$-64m = (88.27)\sin 25° - \frac{9.81}{2}t^2$

solve for t

$(-64 - 37.3)\frac{2}{-9.81} = t^2$

$\boxed{t = 4.54\ sec.}$

MILANO

$\therefore V_A t = 88.27$

$\boxed{V_A = 19.42\,\frac{m}{s}}$

YOU HAVE 2 UNKNOWNS, SO YOU NEED 2 EQUATIONS. SINCE YOU HAVE INFORMATION ON THE DISTANCES, USE THE RELATIONS FOR DISTANCE.

REMEMBER: DOWN = NEGATIVE !