PROB. 11-42

$(X_B)_0 = 0, \quad (X_A)_0 = 120\ ft$

$(V_B)_0 = (V_A)_0 = \left(105 \frac{mi}{H}\right)\left(\frac{H}{3600\ s}\right)\left(\frac{5280\ ft}{mi}\right) = 154 \frac{ft}{s}$

WHEN $X_B = X_A$, $t = 8^s$ AND $V_A = 135 \frac{mi}{H} = 198 \frac{ft}{s}$

FIND a_A, a_B

BOAT A:

$V_A = (V_A)_0 + a_A \cdot t$

$a_A = \frac{V_A - (V_A)_0}{t}$

$a_A = \frac{(198) - (154)\frac{ft}{s}}{(8^s)} = 5.5 \frac{ft}{s^2}$

$X_A = (X_A)_0 + (V_A)_0 \cdot t + \frac{1}{2} a_A \cdot t^2$

$X_A = (120) + (154)(8) + \frac{1}{2}(5.5)(8)^2 = 1528\ ft = X_B$

BOAT B:

$X_B = (X_B)_0 + (V_B)_0 \cdot t + \frac{1}{2} a_B \cdot t^2$

$a_B = \frac{2}{t^2}\left[X_B - (X_B)_0 - (V_B)_0 \cdot t\right]$

$a_B = \frac{2}{(8)^2}\left[(1528) - (0) - (154)(8)\right]$

$a_B = 9.25 \frac{ft}{s^2}$