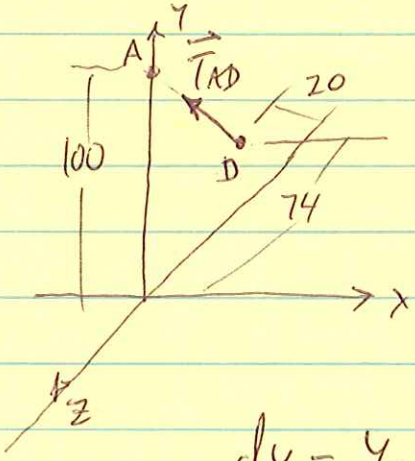
PROB. 2.88

$T_{AD} = 315^{LB}$, FIND $\vec{T}_{AD}$



LOCATE POINTS:

$A(0, 100, 0)^{ft}$, $D(-20, 0, -74)^{ft}$

$d_x = X_A - X_D = 0 - (-20) = 20^{ft}$

$d_y = Y_A - Y_D = 100 - 0 = 100^{ft}$

$d_z = Z_A - Z_D = 0 - (-74) = 74^{ft}$

$d = \sqrt{20^2 + 100^2 + 74^2} = 126^{ft}$

$F_x = F \cdot \frac{d_x}{d} = (315)\left(\frac{20}{126}\right) = 50^{LB}$

$F_y = F \cdot \frac{d_y}{d} = (315)\left(\frac{100}{126}\right) = 250^{LB}$

$F_z = F \cdot \frac{d_z}{d} = (315)\left(\frac{74}{126}\right) = 185^{LB}$

$\vec{T}_{AD} = (50)\hat{i} + (250)\hat{j} + (185)\hat{k}^{LB}$