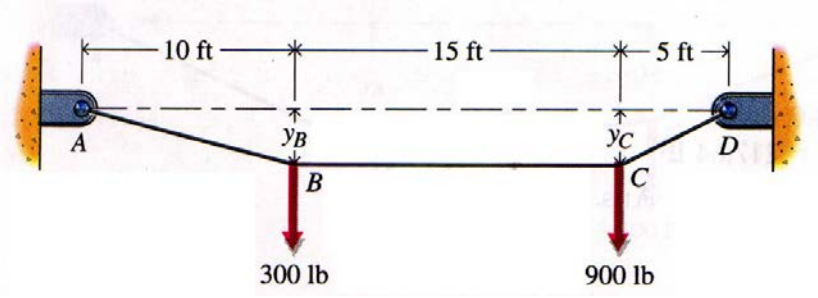
Problem 9: A cable supports two vertical loads as shown. If the maximum tension in the cable is 2000 lbs, determine:

1. The horizontal and vertical components of the reactions at supports A and D.
2. The vertical distance y_B.



$\circlearrowleft \Sigma M_A = 0 = 10(300) + 25(900) - 30 D_y$

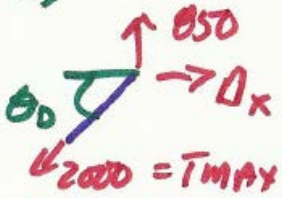
$D_y = 850 \text{ lbs}$

$A_y = 350 \text{ lbs}$

JOINT D

$2000^2 = 850^2 + D_x^2$

$D_x = 1810 = A_x$



JOINT A

$\tan \theta_A = \frac{350}{1810} \Rightarrow \theta_A = 10.94^\circ$

$\tan \theta_A = \frac{y_B}{10} \Rightarrow y_B = 1.93'$

ANSWER: $A_x = 1810$ lbs← $A_y = 350$ lbs ↑ $D_x = 1810$ lbs→
$D_y = 850$ lbs ↑ $y_B = 1.93$ ft