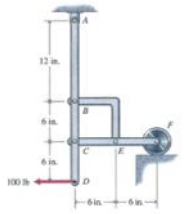
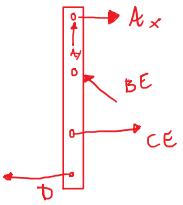
Problem 2

Thursday, November 5, 2020 4:50 PM

Alex Gaskins

Problem 2: A frame is supported at A by a pin/hinge and a roller at F. Find all the forces acting on member AD.





$D = 100$ lbs. to the left

$\sum F_x = 100 - 100 + CE - BE\sin(45) = 0$

$\sum F_y = -200 + BE\cos(45) = 0$

$CE = -BE\sin(45)$

$BE = -\frac{200}{\cos(45)}$

$CE = \left(-\frac{200}{\cos(45)}\right)\sin(45)$

$CE = 200$ lbs. in tension

$BE = 282.84$ lbs.

$\sum F_x = A_x - 100 = 0$

$A_x = 100$ lbs. in + x direction

$\sum F_y = A_y + F_y = 0$

$A_y = -F_y$

$\sum M_A = -100(24) + F_y(12) = 0$

$12F_y = 2400$

$F_y = 200$ lbs

$A_y = 200$ lbs in -y direction