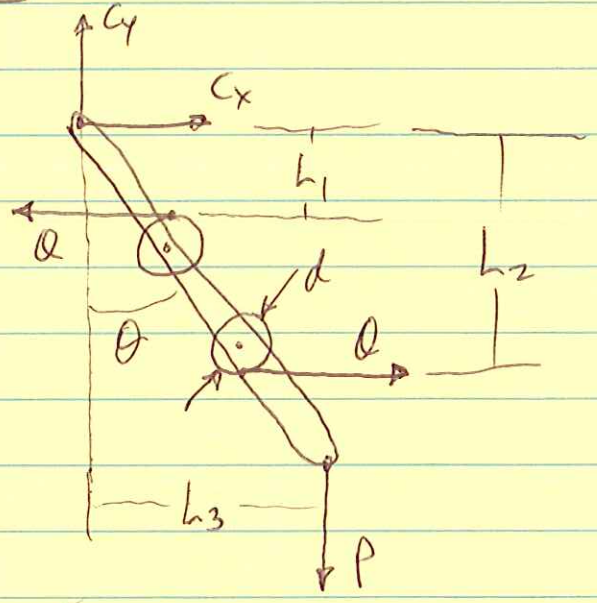
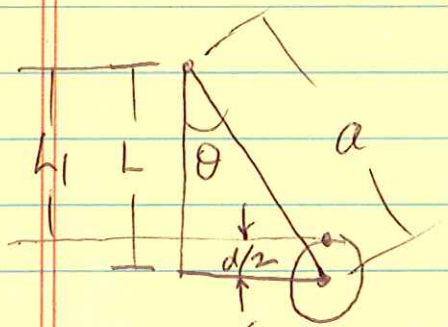
PROB. 4.53

FIND P IN TERMS OF Q, a, d AND θ.

THEN FIND P FOR Q = 10 LB, a = 5 IN, d = 0.8 IN, θ = 30°.

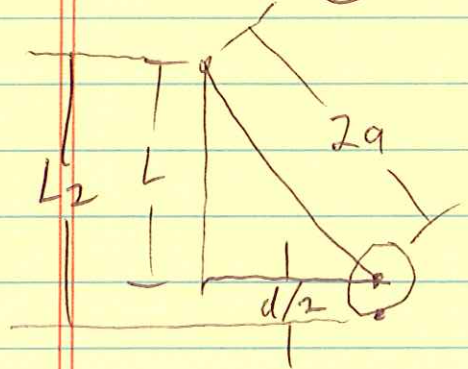
FBDS





$$L = a\cos\theta$$

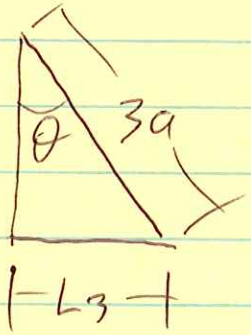
$$L_1 = a\cos\theta - d/2$$



$$L = 2a\cos\theta$$

$$L_2 = 2a\cos\theta + d/2$$

PROB. 4.53 CONT.



$L_3 = 3a \sin\theta$

$\Sigma M_C = 0 \; +\circlearrowleft:$

$-[a\cos\theta - d/2]Q + [2a\cos\theta + d/2]Q$

$-(3a\sin\theta)P = 0$

$P(3a\sin\theta) = Q[2a\cos\theta + d/2 - a\cos\theta + d/2]$

$P = \dfrac{Q}{(3a\sin\theta)} \cdot (a\cos\theta + d)$ ☆

$P = \dfrac{(10^{LB})}{3(5^{IN})\sin 30^\circ} \cdot [(5^{IN})\cos 30^\circ + (0.8^{IN})]$

$P = 6.84^{LB}$