

19. (a) Analyzing the horizontal forces (which add to zero) we find  $F_h = F_3 = 5.0$  N.  
(b) Equilibrium of vertical forces leads to  $F_v = F_1 + F_2 = 30$  N.  
(c) Computing torques about point  $O$ , we obtain

$$F_v d = F_2 b + F_3 a \implies d = \frac{(10)(3.0) + (5.0)(2.0)}{30} = 1.3 \text{ m} .$$