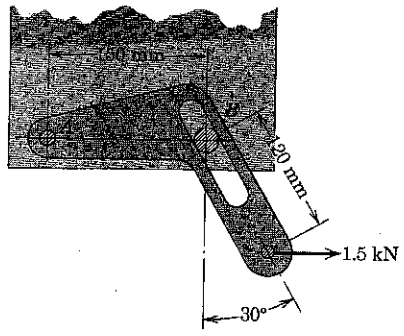
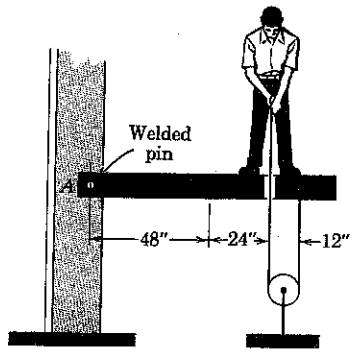
culate the magnitude of the force supported by pin at A under the action of the 1.5-kN load lied to the bracket. Neglect friction in the slot.



Problem 3/29

pin A, which connects the 400-lb steel beam h center of gravity at G to the vertical column, elded both to the beam and to the column. To the weld the 180-lb man loads the beam by rting a 60-lb force on the rope which passes ugh a hole in the beam as shown. Calculate torque (couple) M supported by the pin.

Ans. $M = 3460$ lb-ft



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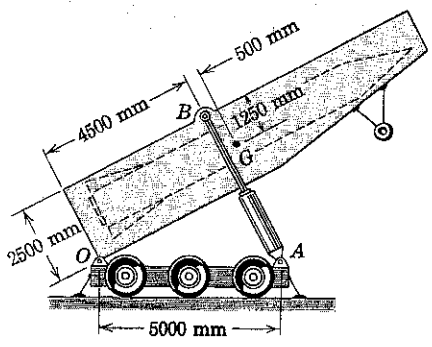

Problem 3/51

3/51 The specially built trailer is used to transport and erect a missile to its vertical launch position. The trailer body and missile have a combined mass of 6.20 Mg with center of mass at G. The unit is tilted into position by two hydraulic cylinders, one on each side of the trailer. Compute the compressive force C in each piston rod of the cylinders for the position where the axis AB of the cylinder is perpendicular to the longitudinal axis of the trailer and missile. *Ans.* $C = 26.7$ kN

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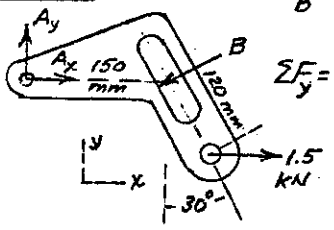

$\Sigma M_B = 0;\ 1.5(120\cos 30°) - 150A_y = 0$

$A_y = 1.039\ kN$

$\Sigma F_y = 0;\ 1.039 - B\sin 30° = 0$

$B = 2.078\ kN$

$\Sigma F_x = 0;\ A_x + 1.5 - 2.078\cos 30° = 0$

$A_x = 0.300\ kN$

$A = \sqrt{(1.039)^2 + (0.300)^2} = \underline{1.082\ kN}$

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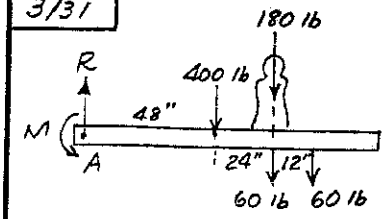

$\Sigma M_A = 0;\ 400(4) + (180+60)6 + 60(7) - M = 0$

$\underline{M = 3460\ lb\text{-}ft}$

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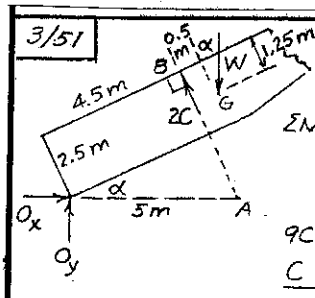

$\alpha = \cos^{-1}\frac{4.5}{5} = 25.84°$

$W = 6.2(9.81) = 60.8\ kN$

$\Sigma M_O = 0;\ 60.8\cos 25.84°(4.5+0.5) - 60.8\sin 25.84°(2.5-1.25) - 2C(4.5) = 0$

$9C = 60.8(5\times 0.9 - 1.25\times 0.4359)$

$\underline{C = 26.7\ kN}$