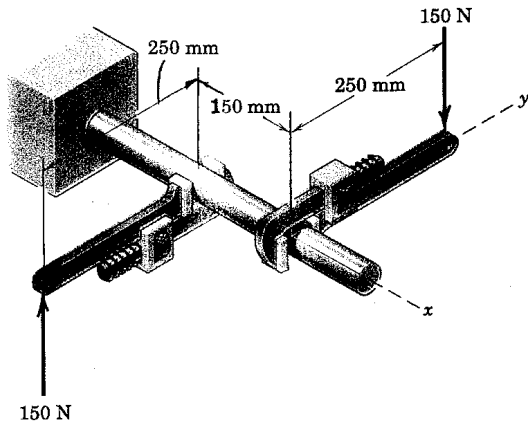


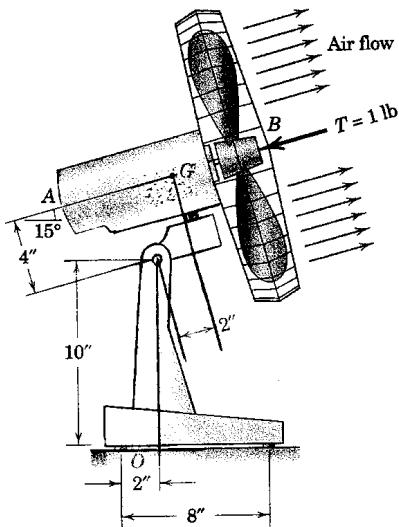
- 2/113 The two forces acting on the handles of the pipe wrenches constitute a couple M . Express the couple as a vector.
Ans. $M = -75i + 22.5j \text{ N}\cdot\text{m}$



Problem 2/113

- 2/153 The blades of the portable fan generate a 1-lb thrust T as shown. Compute the moment M_O of this force about the rear support point O . For comparison, determine the moment about O due to the weight of the motor-fan unit AB , whose weight of 9 lb acts at G .

Ans. $M_O = 13.14 \text{ lb}\cdot\text{in. CCW}$
 $M_{O_w} = 26.1 \text{ lb}\cdot\text{in. CW}$



Problem 2/153

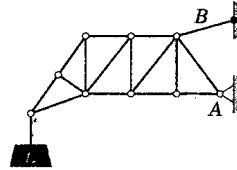
- 3/C Draw a complete and correct free-body diagram of each of the bodies designated in the statements. The weights of the bodies are significant only if the mass is stated. All forces, known and unknown, should be

labeled. (*Note:* The sense of some reaction components cannot always be determined without numerical calculation.)

1. Uniform horizontal bar of mass m suspended by vertical cable at A and supported by rough inclined surface at B .



3. Loaded truss supported by pin joint at A and by cable at B .

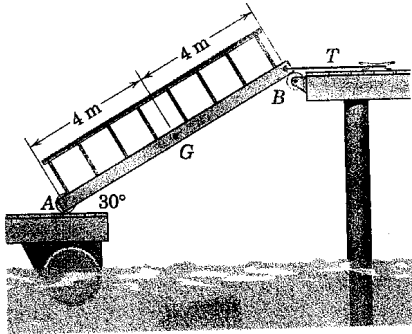


5. Uniform grooved wheel of mass m supported by a rough surface and by action of horizontal cable.



- 3/17** To accommodate the rise and fall of the tide, a walkway from a pier to a float is supported by two rollers as shown. If the mass center of the 300-kg walkway is at G , calculate the tension T in the horizontal cable which is attached to the cleat and find the force under the roller at A .

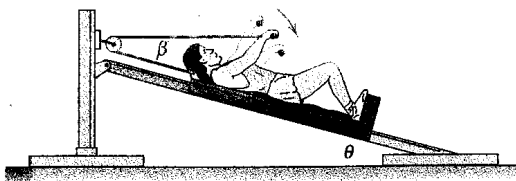
Ans. $T = 850 \text{ N}$, $A = 1472 \text{ N}$



Problem 3/17

- 3/33** The exercise machine is designed with a lightweight cart which is mounted on small rollers so that it is free to move along the inclined ramp. Two cables are attached to the cart—one for each hand. If the hands are together so that the cables are parallel and if each cable lies essentially in a vertical plane, determine the force P which each hand must exert on its cable in order to maintain an equilibrium position. The mass of the person is 70 kg, the ramp angle θ is 15° , and the angle β is 18° . In addition, calculate the force R which the ramp exerts on the cart.

Ans. $P = 45.5 \text{ N}$, $R = 691 \text{ N}$



Problem 3/33