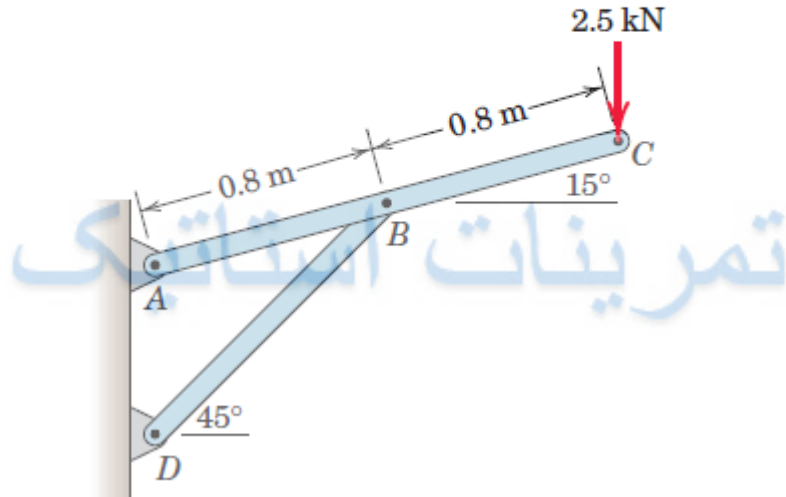


1

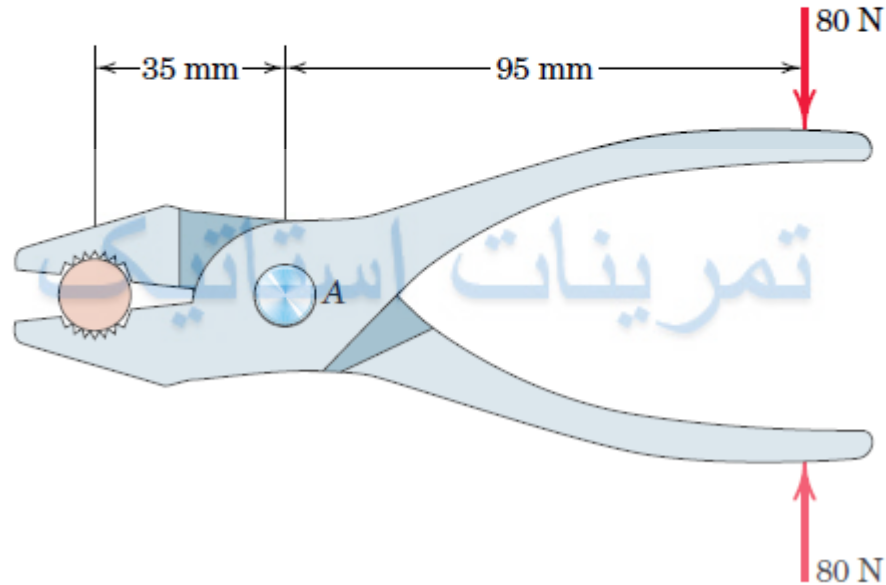
Determine the force in member  $BD$  and the forces supported by all pins in the loaded frame.



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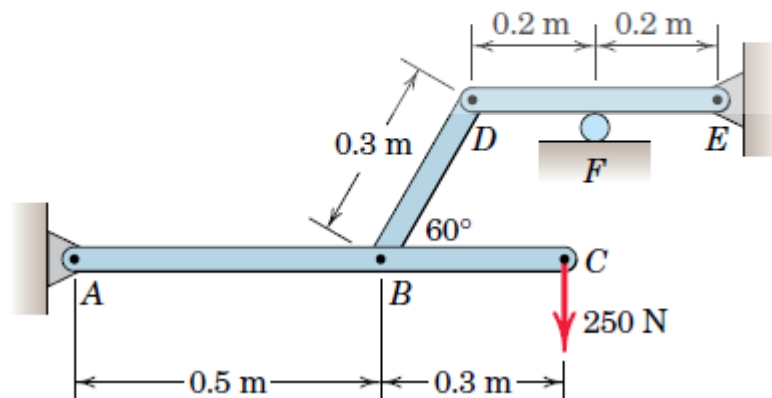
2

For an 80-N squeeze on the handles of the pliers, determine the force  $F$  applied to the round rod by each jaw. In addition, calculate the force supported by the pin at A.



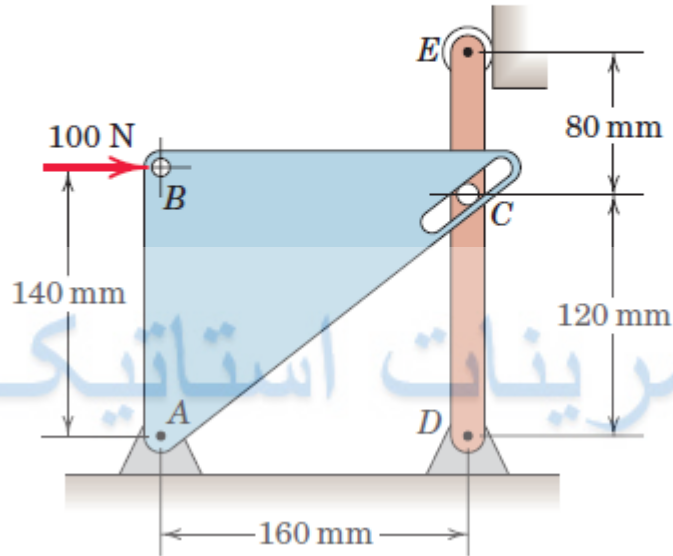
3

Determine the reaction at the roller  $F$  for the frame loaded as shown.



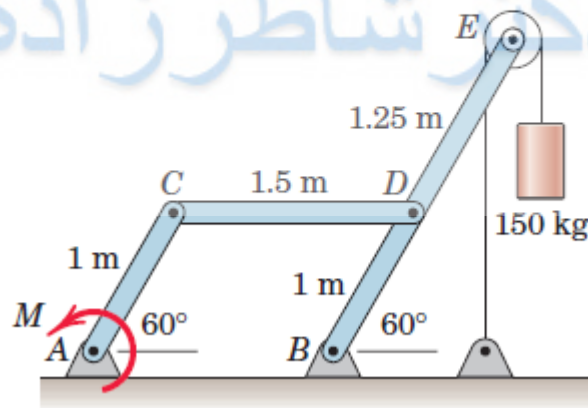
4

Calculate the magnitude of the force acting on the pin at  $D$ . Pin  $C$  is fixed in  $DE$  and bears against the smooth slot in the triangular plate.



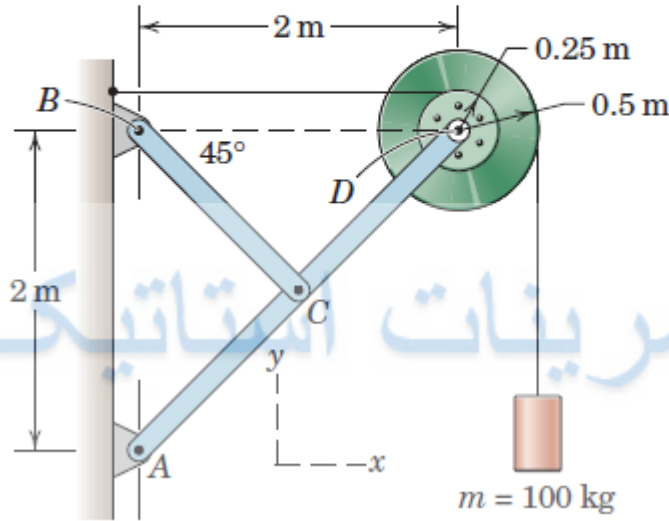
5

Determine the moment  $M$  which must be applied at  $A$  to keep the frame in static equilibrium in the position shown. Also calculate the magnitude of the pin reaction at  $A$ .



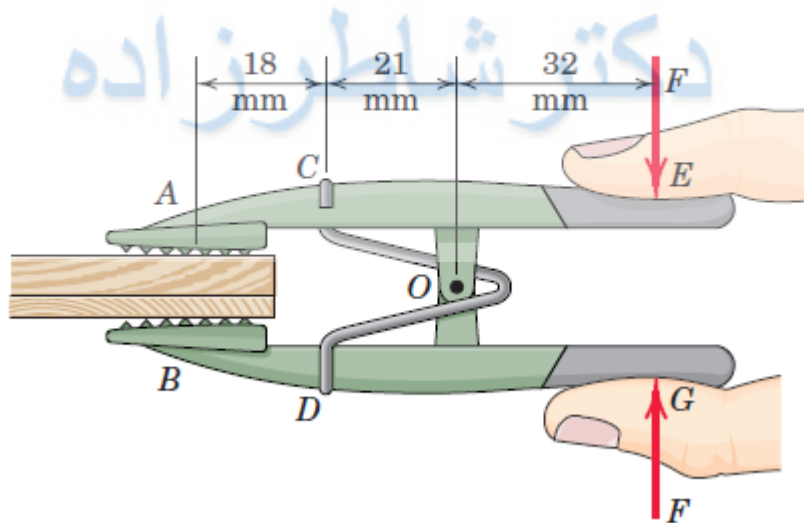
6

Calculate the  $x$ - and  $y$ -components of the force  $C$  which member  $BC$  exerts on member  $ACD$ . The cables are wrapped securely around the two pulleys, which are fastened together.



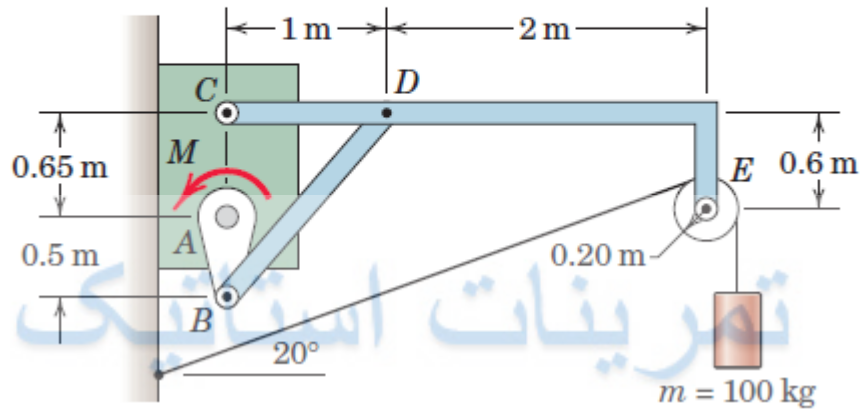
7

If a force  $F = 15 \text{ N}$  is required to release the spring-loaded clamps, what are the normal reactions at  $A$  and  $B$  if  $F = 0$ ?



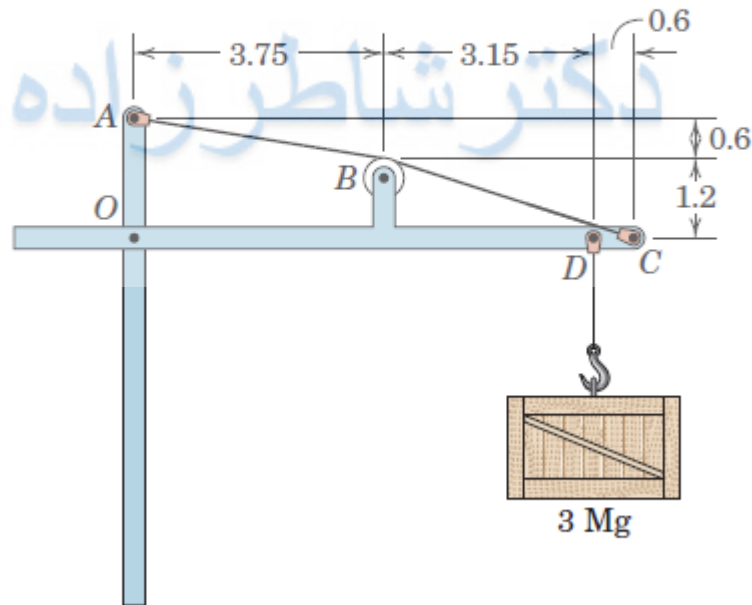
8

When the crank  $AB$  is vertical, the beam  $CD$  is horizontal and the cable makes a  $20^\circ$  angle with the horizontal. Compute the moment  $M$  required for equilibrium of the frame.



9

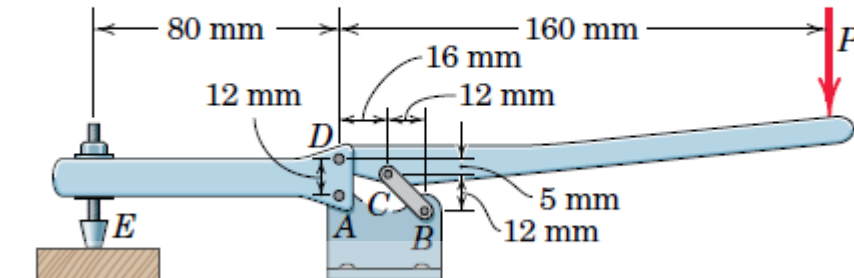
The simple crane supports the  $3\text{-Mg}$  load. Determine the tension  $T$  in the cable and the magnitude of the pin reaction at  $O$ .



Dimensions in meters

10

Determine the vertical clamping force at  $E$  in terms of the force  $P$  applied to the handle of the toggle clamp.



تمرینات استاتیک

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