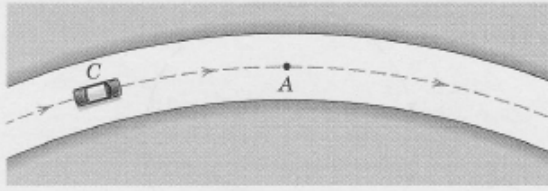
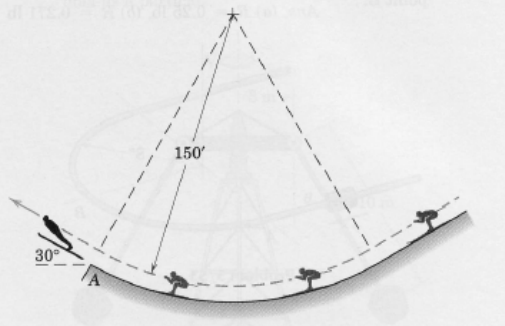


1.  The car  $C$  increases its speed at the constant rate of  $1.5 \text{ m/s}^2$  as it rounds the curve shown. If the magnitude of the total acceleration of the car is  $2.5 \text{ m/s}^2$  at the point  $A$  where the radius of curvature is  $200 \text{ m}$ , compute the speed  $v$  of the car at this point.

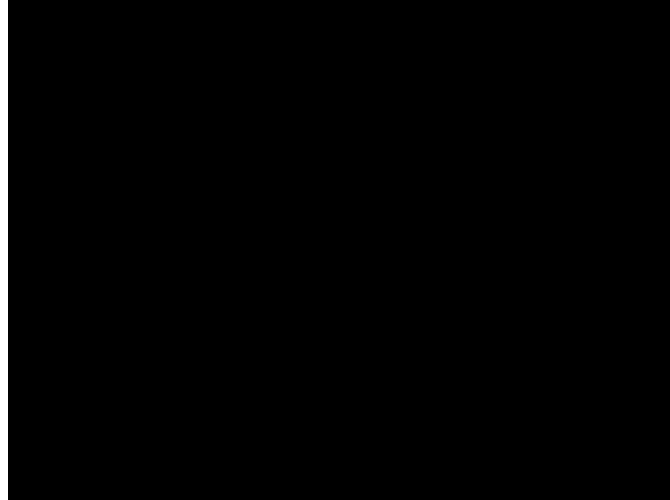
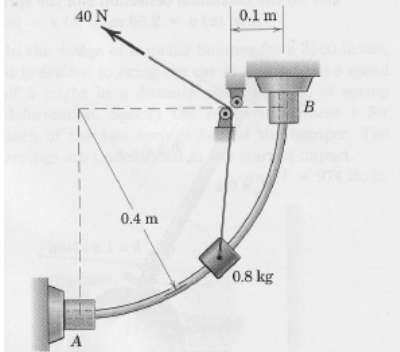


2.  If the 180-lb ski-jumper attains a speed of  $80 \text{ ft/sec}$  as he approaches the takeoff position, calculate the magnitude  $N$  of the normal force exerted by the snow on his skis just before he reaches  $A$ .



3.

The 0.8-kg collar slides freely on the fixed circular rod. Calculate the velocity  $v$  of the collar as it hits the stop at  $B$  if it is elevated from rest at  $A$  by the action of the constant 40-N force in the cord. The cord is guided by the small fixed pulleys.



4.

The 20-lb block is moving to the right with a velocity of 2 ft/sec on a horizontal surface when a force  $P$  is applied to it at time  $t = 0$ . Calculate the velocity  $v$  of the block when  $t = 0.4$  sec. The kinetic coefficient of friction is  $\mu_k = 0.3$ .

