

## Homework of chapter 3

Date:

Name:

Student ID:

Submit time: 20180604

1、 Two blocks are joined by an inextensible cable as shown. If the system is released from rest, determine the velocity of block  $A$  after it has moved 2 m. Assume that the coefficient of kinetic friction between block  $A$  and the plane is  $\mu_k=0.25$  and that the pulley is weightless and frictionless.

2、 In an ore-mixing operation, a bucket full of ore is suspended from a traveling crane which moves along a stationary bridge. The bucket is to swing no more than 10ft horizontally when the crane is brought to a sudden stop. Determine the maximum allowable speed  $v$  of the crane.

3、 Boxes are transported by a conveyor belt with a velocity  $v_0$  to a fixed incline at  $A$  where they slide and eventually fall off at  $B$ . Knowing that  $\mu_k=0.40$ , determine the velocity of the conveyor belt if the boxes are to have zero velocity at  $B$ .

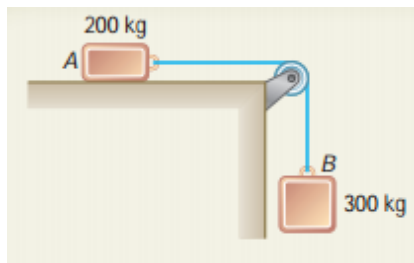


Fig.1

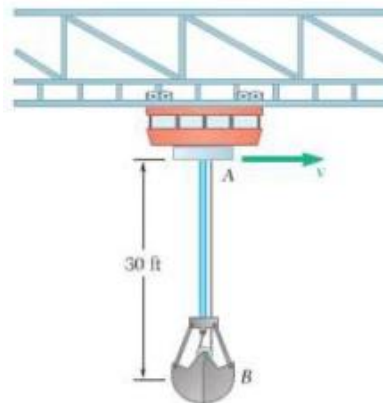


Fig.2

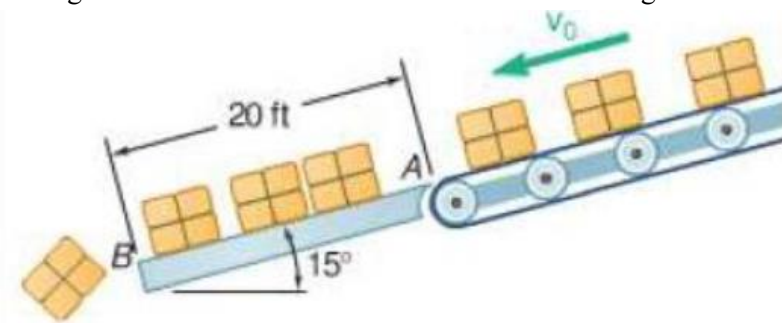


Fig.3

- 4、 The system shown is at rest when a constant 30-lb force is applied to collar B. (a) If the force acts through the entire motion, determine the speed of collar B as it strikes the support at C. (b) After what distance  $d$  should the 30-lb force be removed if the collar is to reach support C with zero velocity?

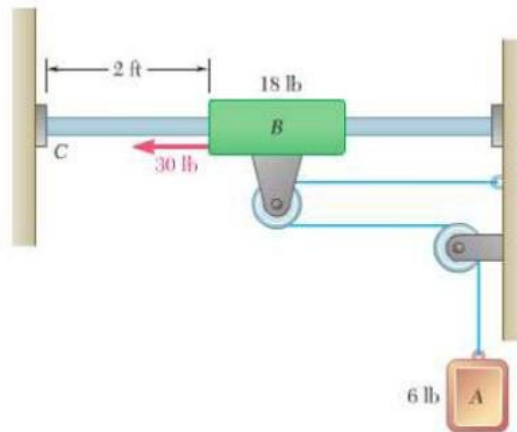


Fig.4

- 5、 A small block slides at a speed  $v$  on a horizontal surface. Knowing that  $h=0.9\text{m}$ , determine the required speed of the block if it is to leave the cylindrical surface BCD when  $\theta=30^\circ$ .

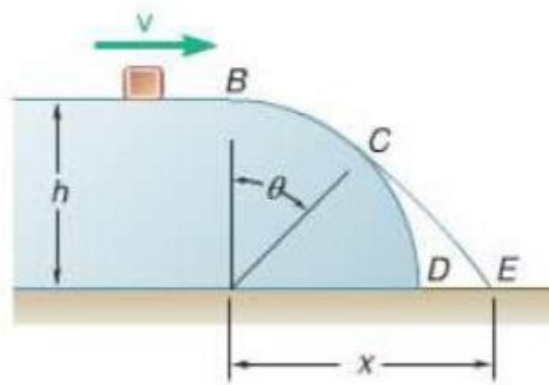


Fig.5