

所別： 機電工程研究所 組別： _____ 科目： 動力學

注意： 不准 一般計算器 工程用計算器，考試時間總計：分鐘。試題共 1 頁，第 1 頁

每題 25 分，總分 100 分。

1. Pinion gear A rolls on the gear racks B and C . If B is moving to the right at 2.4 m/s and C is moving to the left at 1.2 m/s, determine the angular velocity of the pinion gear and the velocity of its center A . (See Fig. 1)
2. The skateboard rider leaves the ramp at A with an initial velocity v_A at a 30° angle. If he strikes the ground at B , determine v_A and the time of flight. (See Fig. 2)
3. Crank AB rotates with a constant angular velocity of 5 rad/s. Determine the velocity of block C and the angular velocity of link BC at the instant $\theta = 30^\circ$. (See Fig. 3)
4. The 3-kg block is released from rest at A and slides down the smooth parabolic surface. Determine the maximum compression of the spring. (See Fig. 4)

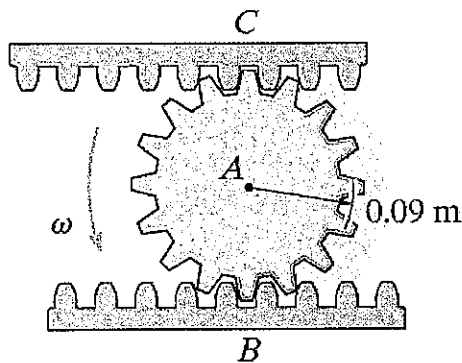


Fig. 1

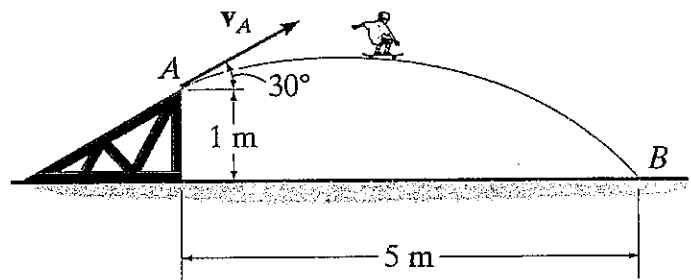


Fig. 2

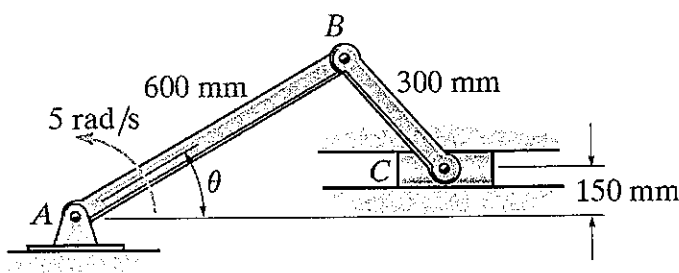


Fig. 3

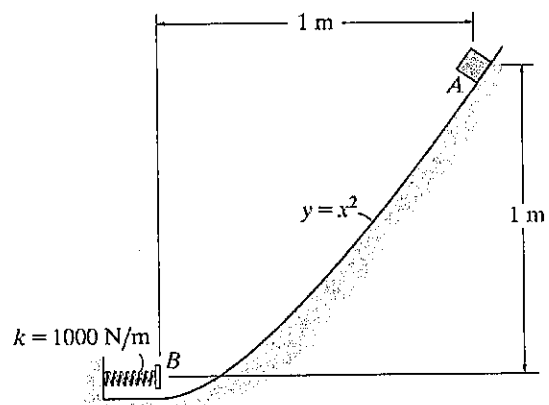


Fig. 4