DYNAMICS

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- Vector Mechanics for Engineers: Dynamics, 10th edition. Ferdinand Beer- E. Russell Johnston Jr. - Phillip Cornwell.
- Engineering Mechanics-Dynamics, 7th Edition. J. L. Meriam, L. G. Kraige.
- Other Reference: Brain P.Self "Lectures notes on Dynamics"

Kinetics of Particles: Energy and Momentum Methods
(Homework-03)

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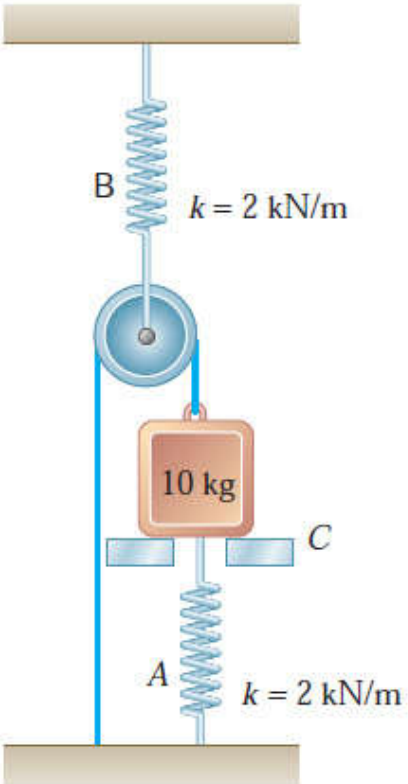
سینتیک ذرات : انرژی

❑ سوال ۱

A 10-kg block is attached to spring A and connected to spring B by a cord and pulley. The block is held in the position shown with both springs unstretched when the support is removed and the
block is released with no initial velocity. Knowing that the constant of each spring is 2 kN/m, determine (a) the velocity of the block after it has moved down 50 mm, (b) the maximum velocity achieved by the block.

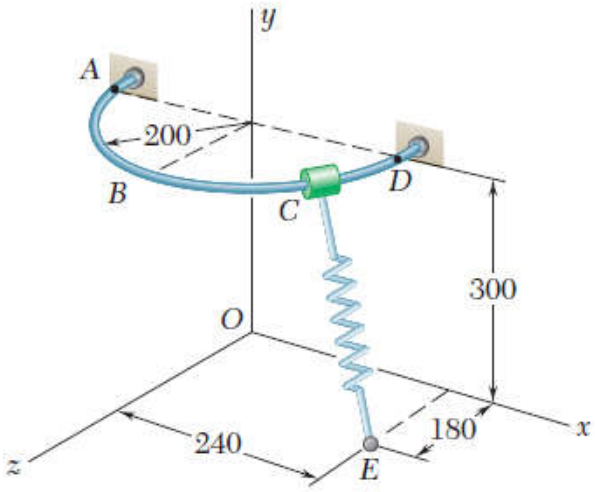


Key Answer: (a) 0.597 m/s. (b) 0.617 m/s.

سینتیک ذرات : انرژی

❑ سوال 2

A 600-g collar C may slide along a horizontal, semicircular rod ABD. The spring CE has an undeformed length of 250 mm and a spring constant of 135 N/m. Knowing that the collar is released from rest at A and neglecting friction, determine the speed of the collar (a) at B, (b) at D.



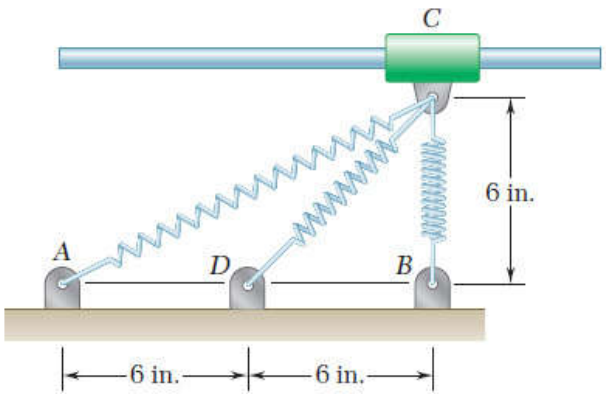
Dimensions in mm

Key Answer: (a) 4.22 m/s. (b) 4.42 m/s.

سینتیک ذرات : انرژی

❑ سوال 3

A 3-lb collar C may slide without friction along a horizontal rod. It is attached to three springs, each of constant k 5 2 lb/in. and 6-in. undeformed length. Knowing that the collar is released from rest in the position shown, determine the maximum speed it will reach in the ensuing motion.



Key Answer: 9.35 ft/s (left and right).