

大同大學 102學年度轉學入學考試試題

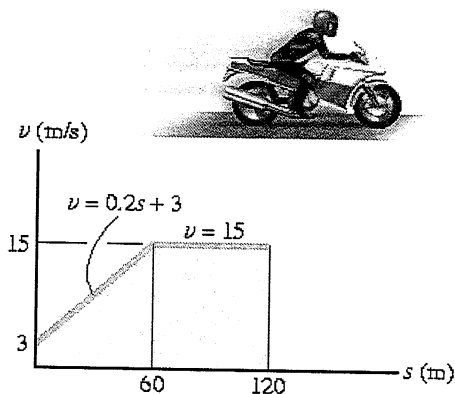
考試科目：工程力學

所別：機械工程學系

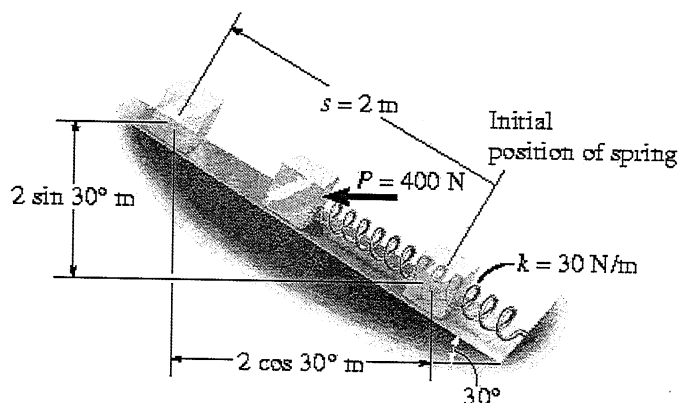
第 1/2 頁

註：本次考試 不可以參考自己的書籍及筆記； 不可以使用字典； 不可以使用計算器。

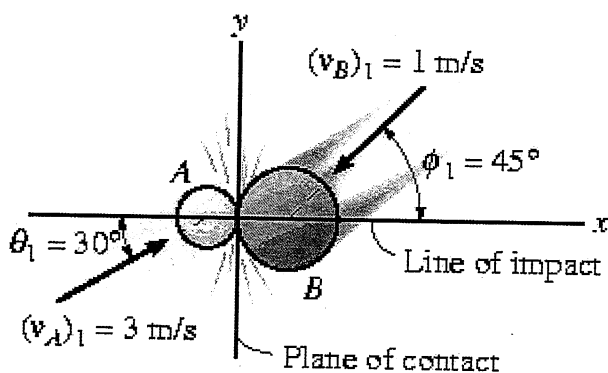
1. (15%) The v - s graph describing the motion of a motorcycle is shown in figure. Determine the time needed for the motorcycle to reach the position $s = 100$ m.



2. (15%) The 10-kg block rests on an incline. The coefficient of the kinetic friction between the block and the incline is $\mu_k = 0.2$. If the spring is originally stretched 0.5 m, determine the block's speed when a horizontal force $P = 400$ N pushes the block up the plane $s = 2$ m.



3. (20%) Two smooth disks A and B , having mass of 1 kg and 2 kg respectively, collide with the velocities shown in the figure. If the coefficient of restitution for the disks is $e = 0.6$, determine the loss of energy during collision.



〈背面繼續〉

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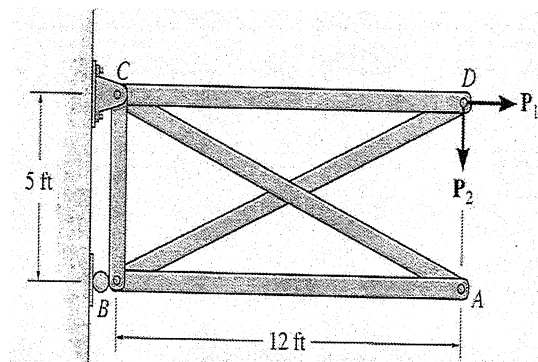
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第 2/2 頁

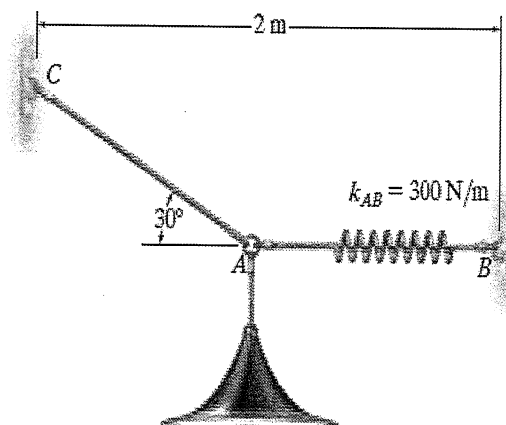
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4. (20%) Determine the force in all the truss members (do not forget to mention whether they are in T or C).
 $P_1 = 240 \text{ lb}$ and $P_2 = 100 \text{ lb}$



5. (15%) Determine the required length of the cord AC so that the 8 kg lamp is suspended. The undeformed length of the spring AB is 0.4 m , and the spring has a stiffness of $k_{AB} = 300 \text{ N/m}$.



6. (15%) The woman exercises on the rowing machine. If she exerts a holding force of $F = 200 \text{ N}$ on handle ABC , determine the horizontal and vertical components of reaction at pin C and the force developed along the hydraulic cylinder BD on the handle.

