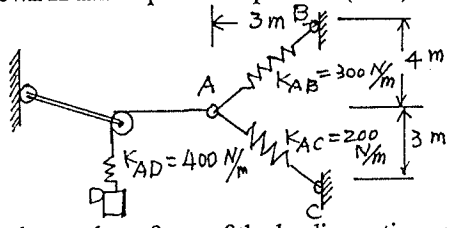
淡江大學八十七學年度碩士班入學考試試題

系別： 交通管理學系　　科目： 力學(含動力學、靜力學)

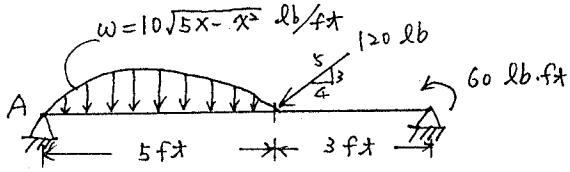
1、Determine the stretch of each spring for equilibrium of the 40-kg block. The springs are shown in their equilibrium position.(20%)

Fig.1



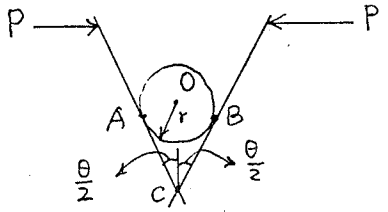
2、Determine the resultant force of the loading acting on the beam, and specify its location measured from end A.(20%)

Fig.2



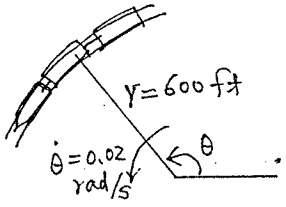
3、The pipe shown in Fig.3 is gripped between two levers that are pinned together at C. If the coefficient of static friction between the levers and the pipe is μ=0.32, determine the maximum angle θ at which the pipe can be gripped without slipping. Neglect the weight of the pipe.(20%)

Fig.3



4、A train is traveling along the circular curve of radius r=600 ft. At the instant shown, its angular rate of rotation is $\dot{\theta} = 0.02 rad/s$, which is decreasing at $\ddot{\theta} = -0.001 rad/s^2$. Determine the magnitude of the train's velocity and acceleration at the instant.(20%)

Fig.4



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5、The 50-lb wheel shown in Fig.5 has a radius of gyration $k_G = 0.70\,ft$. If a 35-lb.ft couple moment is applied to the wheel, determine the acceleration of its mass center G. The coefficients of static and kinetic friction between the wheel and the plane at A are $\mu_s = 0.3$ and $\mu_k = 0.24$, respectively.(20%)

Fig.5