國立屏東科技大學 九十三 學年度 碩士班暨碩士在職專班 招生考試
機械工程系碩士班 甲組
專業科目（二）靜力學 試題

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1. Two cables are tied together at C and are loaded as shown in Fig.1. Determine the tension (a) in cable AC, (b) in cable BC. (10%)

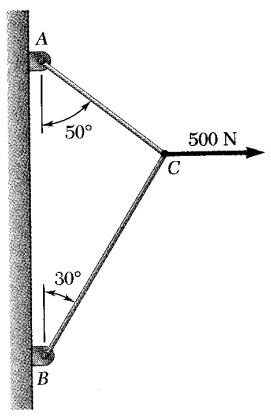

Fig. 1 for Problem 1

2. A 4.80-m-long beam is subjected to the forces shown in Fig.2. Reduce the given system of forces to (a) an equivalent force-couple system at A, (b) an equivalent force-couple system at B. (20%)

   Note: Since the reactions at the supports are not included in the given system of forces, the given system will not maintain the beam in equilibrium.

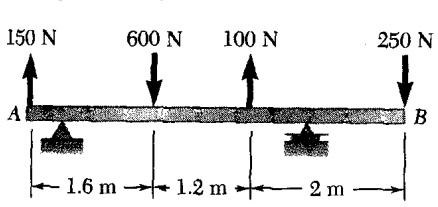

Fig. 2 for Problem 2

3. Member ABC is supported by a pin and bracket at B and by an inextensible cord attached at A and C and passing over a frictionless pulley at D. The tension may be assumed to be the same in portions AD and CD of the cord. For the loading shown in Fig.3 and neglecting the size of the pulley, determine the tension in the cord and the reaction at B. (20%)

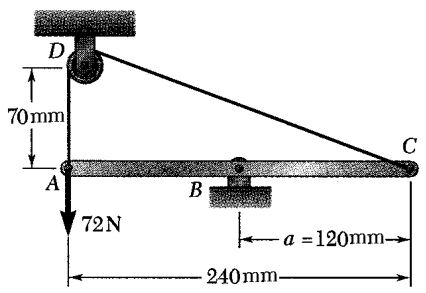

Fig. 3 for Problem 3

4. Using the method of joints, determine the force in each member of the truss shown in Fig.4. State whether each member in tension or compression. (20%)

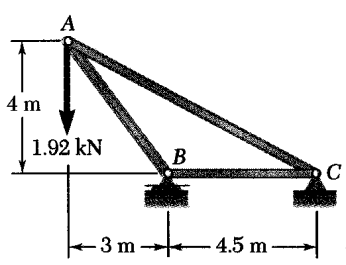

Fig. 4 for Problem 4

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5. Two forces are applied at point B of beam AB shown in Fig.5. Determine graphically the magnitude and direction of their resultant using (a) the parallelogram law, (b) the triangle rule. (10%)

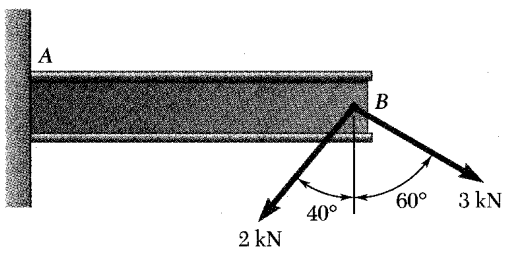

Fig. 5 for Problem 5

6. Determine whether the block shown in Fig.6 is in equilibrium and find the magnitude and direction of the friction force when θ = 35° and P = 100 N. (10%)

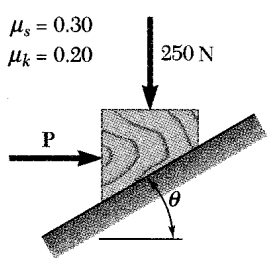

Fig. 6 for Problem 6

7. Using the method of virtual work, determine the reaction at D shown in Fig.7. (10%)

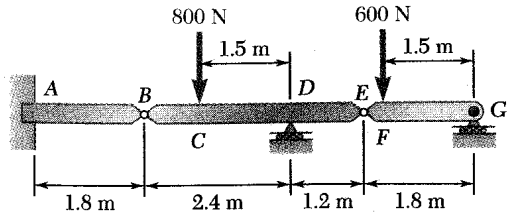

Fig. 7 for Problem 7