48-1

淡江大學 102 學年度日間部轉學生招生考試試題

系別：航空太空工程學系三年級　　科目：工程力學(含靜力學、動力學)

考試日期：7 月 24 日(星期三) 第 1 節　　本試題共 4 大題， 2 頁

1. One of the two forces that constitute a couple is $\vec{F} = 3\vec{i} - 4\vec{j} + 5\vec{k}$ *lb*, having a line of action that passes through the point *A* at (0, 6, 5) ft. The other force has a line of action that passes through point *B* at (-4, 0, 2) ft. Find the moment of the **couple**, and the **distance** between the lines of action of the forces. (25%)

2. Determine the moments of inertia *Ix* and *Iy* of the area shown in *Figure* 2 with respect to centroidal axes respectively parallel and perpendicular to side *AB*. (25%)

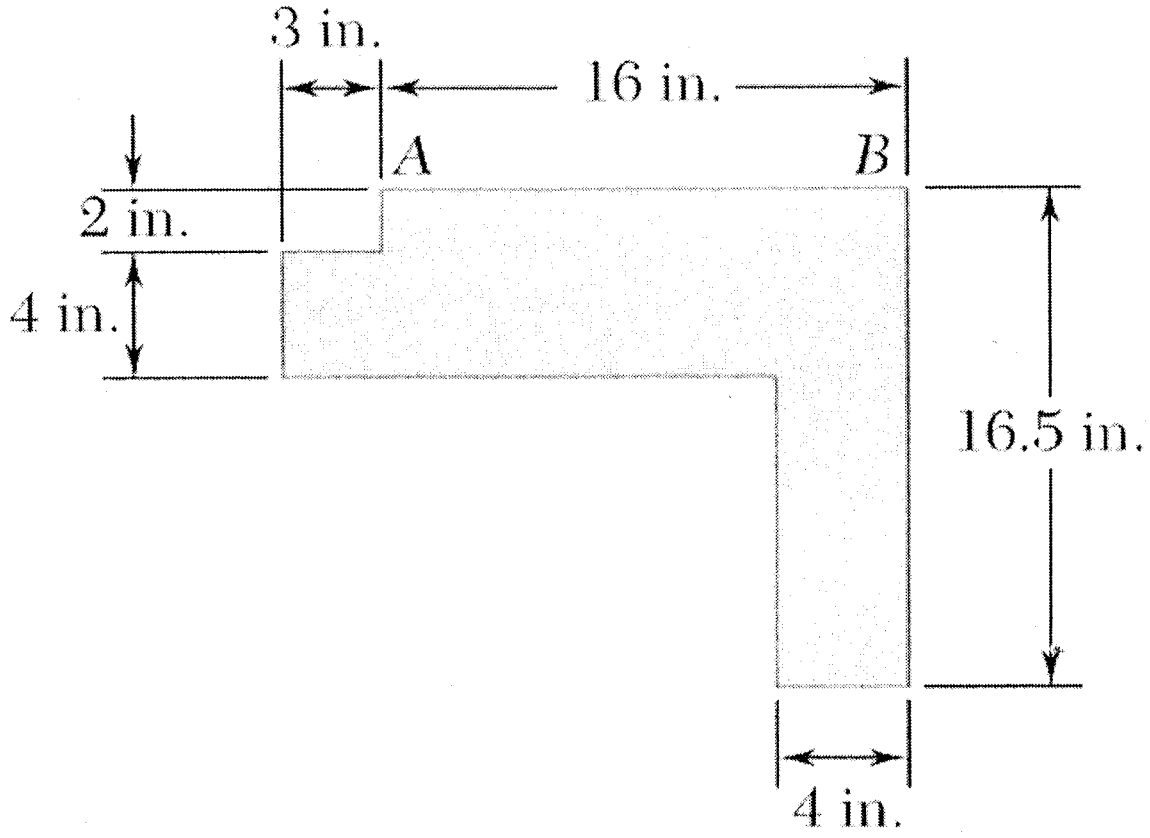

Figure 2.

本試題雙面印刷

48-2

淡江大學 102 學年度日間部轉學生招生考試試題

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3. A 1.5-*lb* ball *A* is moving with a velocity of magnitude 18 *ft/s* when it is hit by a 2.5-*lb* ball *B* which has a velocity of magnitude 12 *ft/s* as shown in *Figure* 3. Knowing that the coefficient of restitution is 0.8 and assuming no friction, determine the velocity of each ball after impact. (25%)

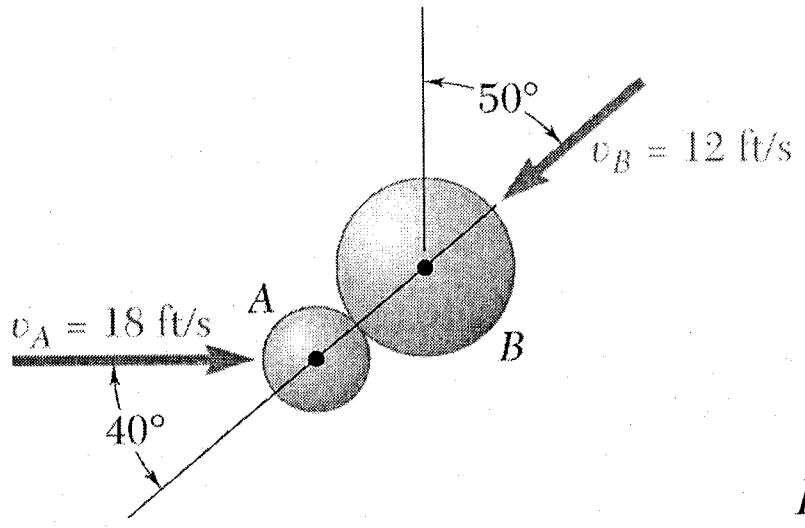

Figure 3.

4. The two pin-connected bars each have a weight of 10 *lb/ft* as shown in *Figure* 4. If a moment of *M*=60 *lb-ft* is applied to bar *AB*, determine the initial vertical reaction at *C* and the horizontal and vertical components of reaction at *B*. Neglected the size of the roller at *C*. The bars are initially at rest. (25%)

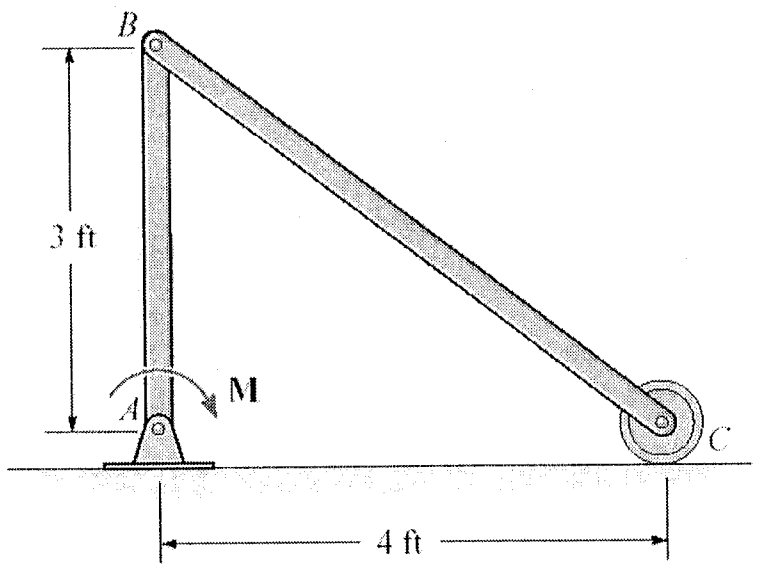

Figure 4.