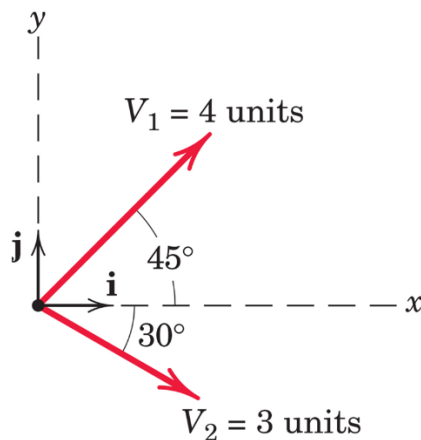


110 學年度秋季班機械工程學系機械產業碩士專班 筆試題目

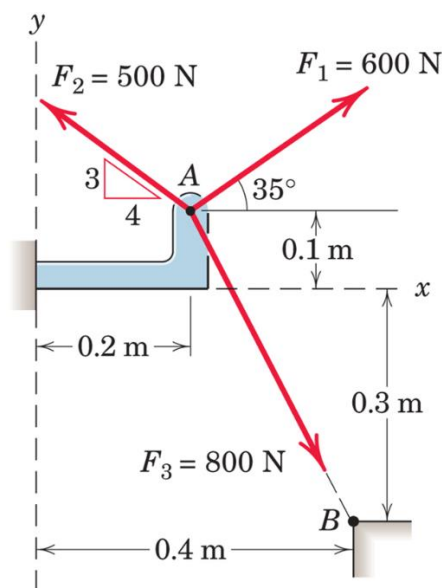
系所：機械工程學系 考試科目：靜力學 考試日期：0410 第1頁，共2頁

※ 考生請注意：本試題可使用計算機。 請於答案卷作答，於本試題紙上作答者，不予計分。

1. For the vectors \mathbf{V}_1 and \mathbf{V}_2 shown in the figure,
 - (a) (5%) determine the magnitude S of their vector sum $\mathbf{S} = \mathbf{V}_1 + \mathbf{V}_2$
 - (b) (5%) determine the angle α between \mathbf{S} and the positive x-axis
 - (c) (5%) write \mathbf{S} as a vector in terms of the unit vectors \mathbf{i} and \mathbf{j} and then write a unit vector \mathbf{n} along the vector sum \mathbf{S}
 - (d) (10%) determine the vector difference $\mathbf{D} = \mathbf{V}_1 - \mathbf{V}_2$



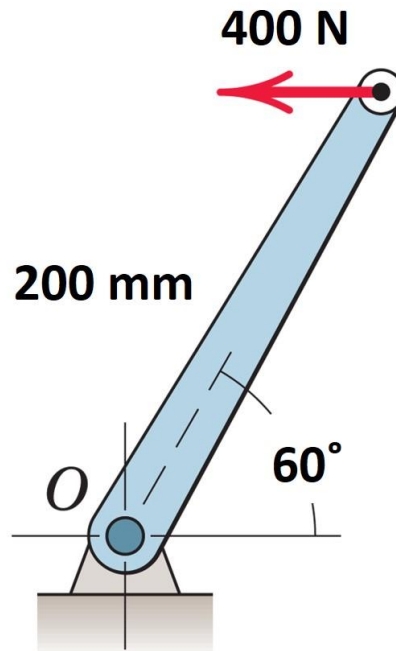
2. (25%) The forces \mathbf{F}_1 , \mathbf{F}_2 , and \mathbf{F}_3 , all of which act on point A of the bracket, are specified in three different ways. Determine the x and y scalar components of each of the three forces.



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3. (25%) Replace the horizontal 400-N force acting on the lever by an equivalent system consisting of a force at O and a couple.



4. (25%) Determine the magnitude T of the tension in the supporting cable and the magnitude of the force on the pin at A for the jib crane shown. The beam AB is a standard 0.5 m I beam with a mass of 95 kg per meter of length.

