Course Code: ESC106A
Course Title: Construction Materials and Engineering Mechanics

Lecture No. 18:
Problems on Coplanar Non-Concurrent Force Systems

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Lecture Intended Learning Outcomes

At the end of this lecture, students will be able to:

- Describe Varignon's Theorem

- Apply the method of resolution and find the resultant of coplanar non concurrent force system

- Solve the unknown forces given the resultant of non concurrent force system

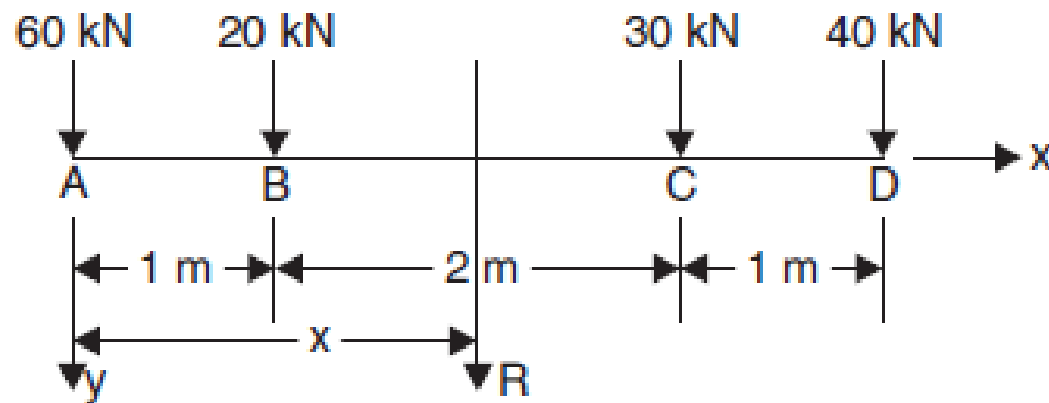- Calculate the angles of applied forces given the resultant of concurrent force system

Contents

Varignon's theorem, coplanar non concurrent force system, problems on non concurrent force system

Problems

1.Determine the resultant of four parallel forces acting on the axle of a vehicle as shown in Figure
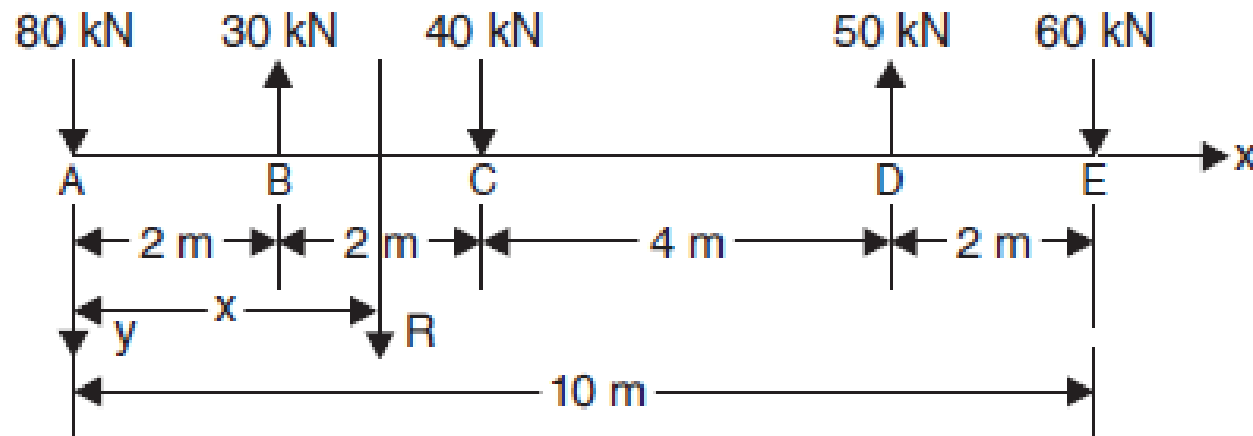

x=1.8m

Problems

2. Determine the resultant of system of parallel forces acting on a beam as shown in Figure

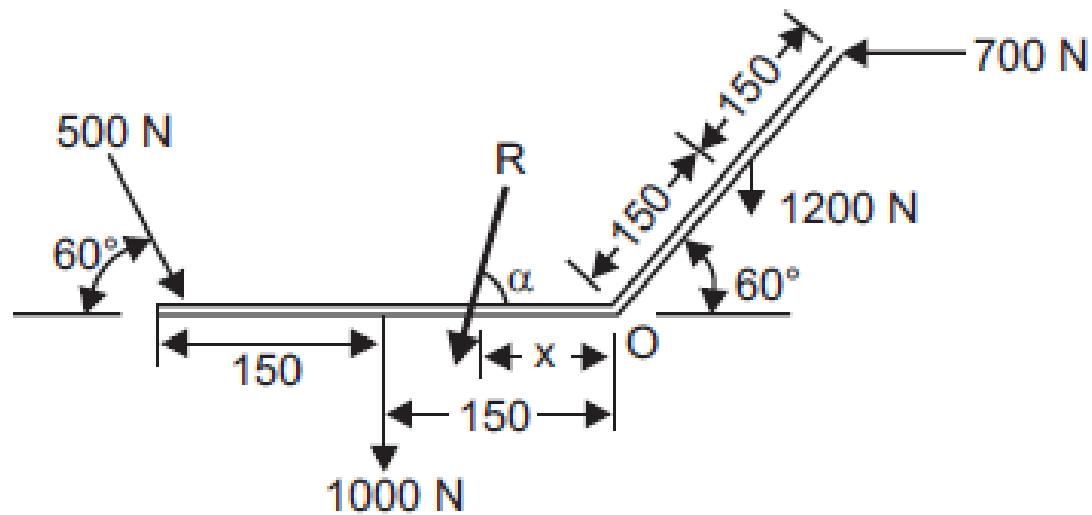
x=3.0m

Problems

3. The system of forces acting on a bell crank is shown in Figure. Determine the magnitude, direction and the point of application of the resultant

x=141.95m

Problems

4. A building frame is subjected to wind loads as shown in Figure. Determine the resultant of the loads.

d=1.5m

Summary

- The forces can be resolved and the resultant of Coplanar Non Concurrent force system can be obtained

- The concept of Varignon theorem is applied to obtain the moment of the resultant force