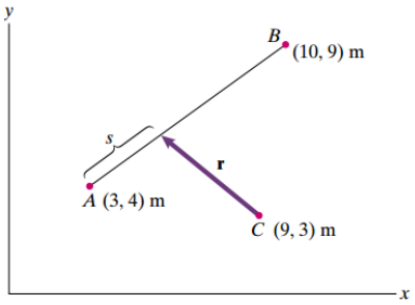
GEN_ENG_205-2 – Engineering Analysis II

HOMEWORK 2

2.60, 2.83, 2.97, 2.114, 2.119, 2.120, 2.135, 2.138

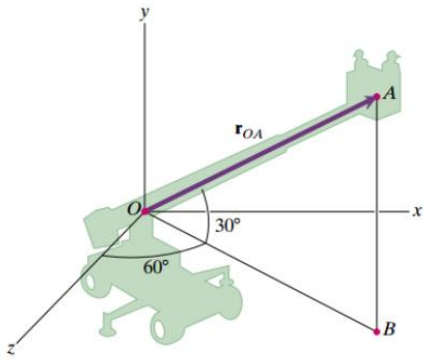
2.60 Let **r** be the position vector from point C to the point that is a distance s meters from point A along the straight line between A and B. Express **r** in terms of components. (Your answer will be in terms of s.)



Problem 2.60

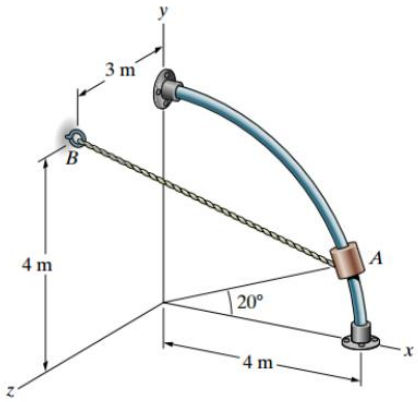
2.83 The distance from point O to point A is 20 ft. The straight line AB is parallel to the y axis, and point B is in the x–z plane. Express the vector $\mathbf{r}_{OA}$ in terms of components.

Strategy: You can express $\mathbf{r}_{OA}$ as the sum of a vector from O to B and a vector from B to A. You can then express the vector from O to B as the sum of vector components parallel to the x and z axes. See Example 2.8.



Problem 2.83

2.97 The circular bar has a 4-m radius and lies in the x–y plane. Express the position vector from point B to the collar at A in terms of components.

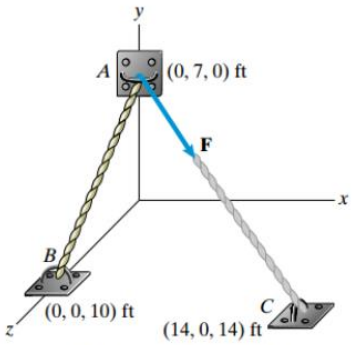


Problems 2.97/2.98

2.114 Cables extend from A to B and from A to C. The cable AC exerts a 1000-lb force $\mathbf{F}$ at A.

(a) What is the angle between the cables AB and AC?

(b) Determine the vector component of $\mathbf{F}$ parallel to the cable AB.



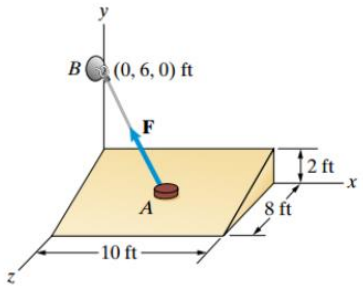
Problems 2.114/2.115

GEN_ENG_205-2 – Engineering Analysis II

HOMEWORK 2

2.119 The disk A is at the midpoint of the sloped surface. The string from A to B exerts a 0.2-lb force $\mathbf{F}$ on the disk. If you express $\mathbf{F}$ in terms of vector components parallel and normal to the sloped surface, what is the component normal to the surface?

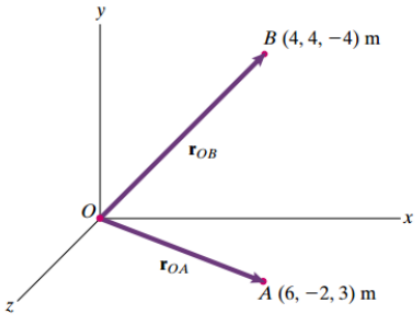
2.120 In Problem 2.119, what is the vector component of $\mathbf{F}$ parallel to the surface?



Problems 2.119/2.120

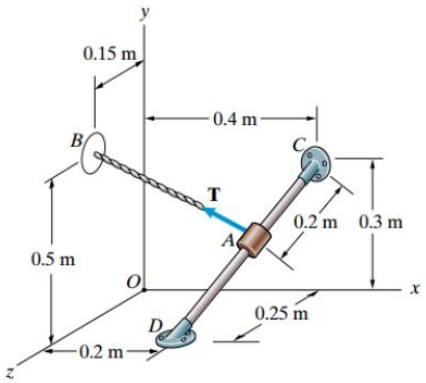
*(Both problems need to be solved 2.119/2.120)

2.135 Use the cross product to determine the length of the shortest straight line from point B to the straight line that passes through points O and A.



Problems 2.134/2.135

2.138 The rope AB exerts a 50-N force $\mathbf{T}$ on the collar at A. Let $\mathbf{r}_{CA}$ be the position vector from point C to point A. Determine the cross product $\mathbf{r}_{CA} \times \mathbf{T}$.



Problem 2.138