GNG 1105E – Engineering Mechanics

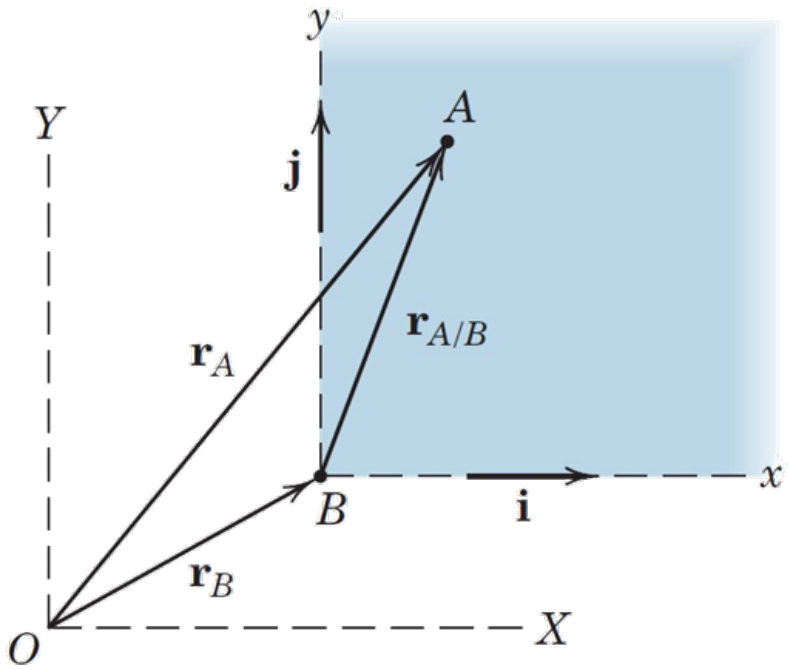
CHAPTER D2 – KINEMATICS OF PARTICLES

Assigned readings

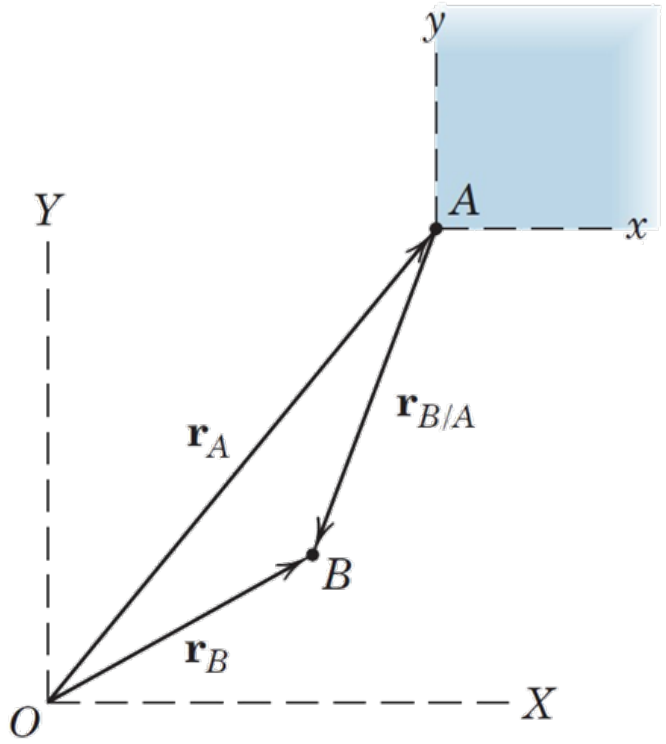
2/8 Relative motion

2/9 Constrained motion of connected particles

2/8 Relative motion

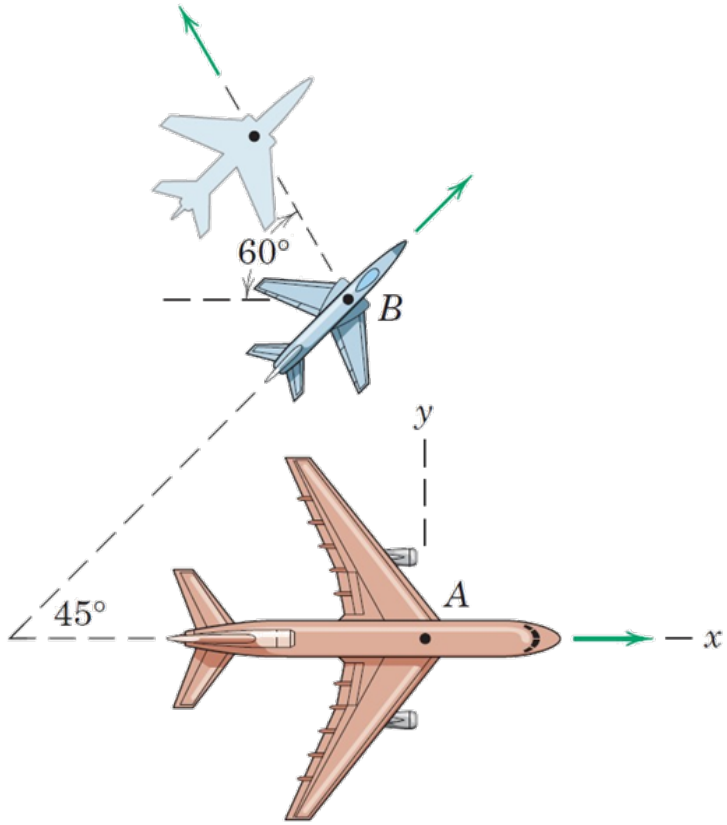


2/8 Relative motion

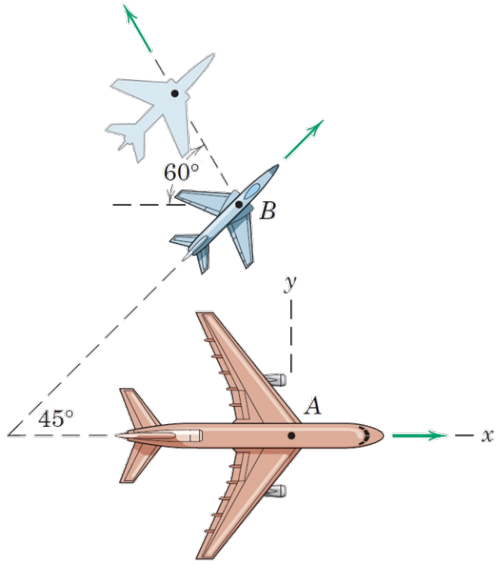


Sample problem 2/13

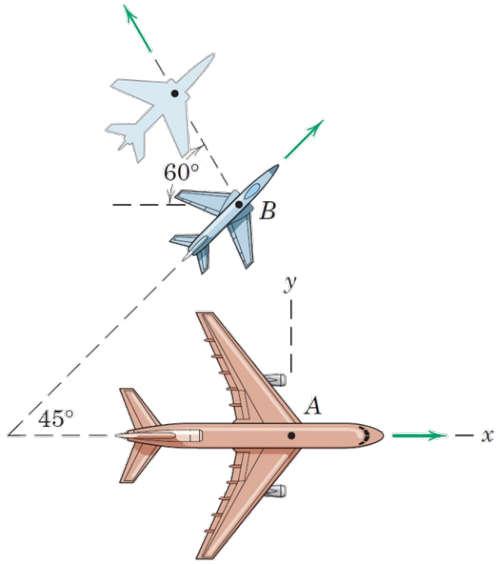
Passengers in the jet transport *A* flying east at a speed of 800 km/h observe a second jet plane *B* that passes under the transport in horizontal flight. Although the nose of *B* is pointed in the 45° northeast direction, plane *B* appears to the passengers in *A* to be moving away from the transport at the 60° angle as shown. Determine the true velocity of *B*.



Sample problem 2/13

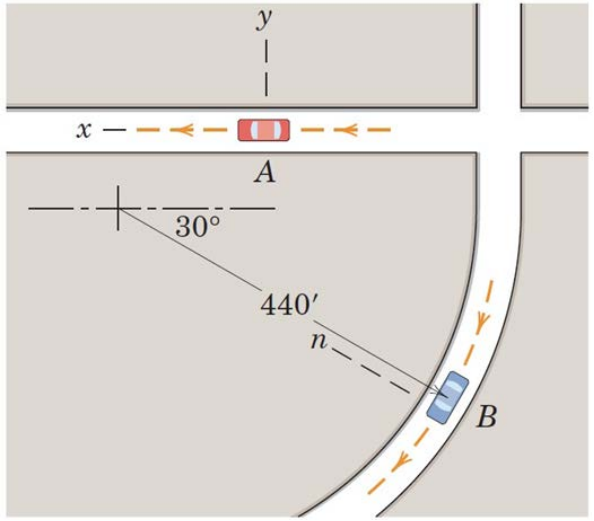


Sample problem 2/13

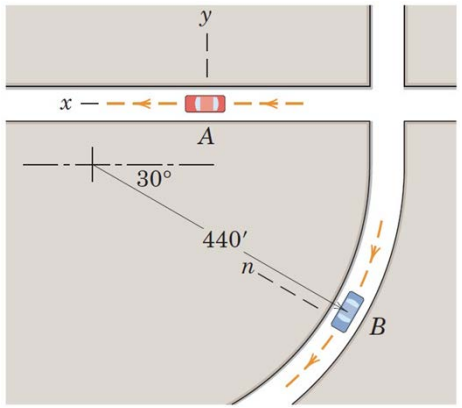


Sample problem 2/14

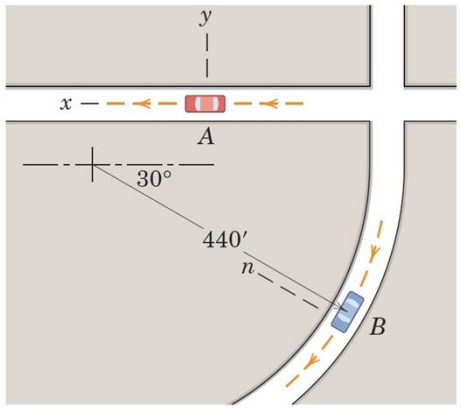
Car *A* is accelerating in the direction of its motion at the rate of 3 ft/sec^2. Car *B* is rounding a curve of 440-ft radius at a constant speed of 30 mi/hr. Determine the velocity and acceleration which car *B* appears to have to an observer in car *A* if car *A* has reached a speed of 45 mi/hr for the positions represented.



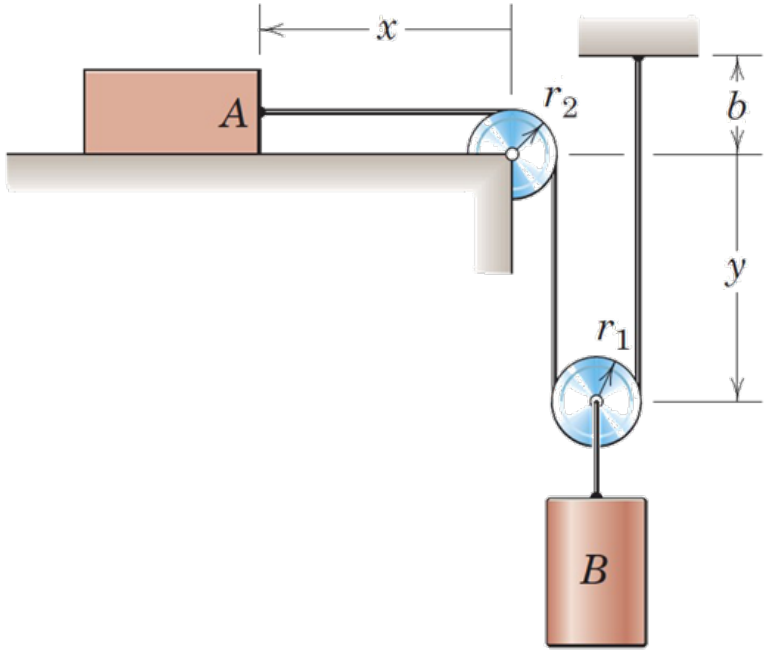
Sample problem 2/14



Sample problem 2/14



2/9 Constrained motion of connected particles



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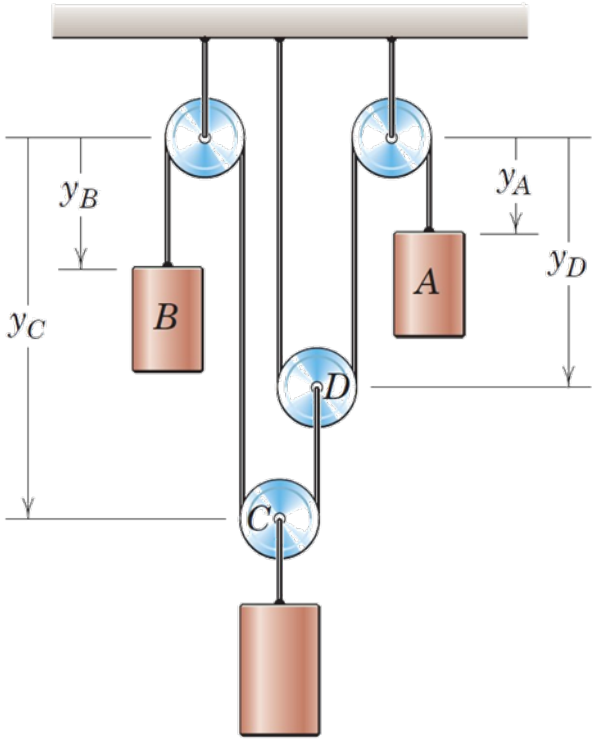
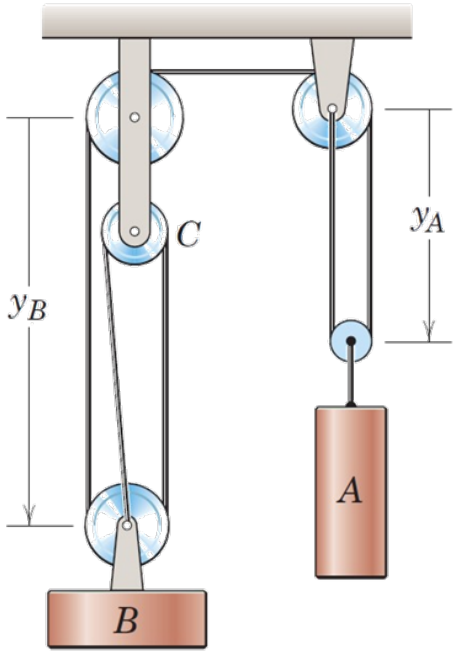
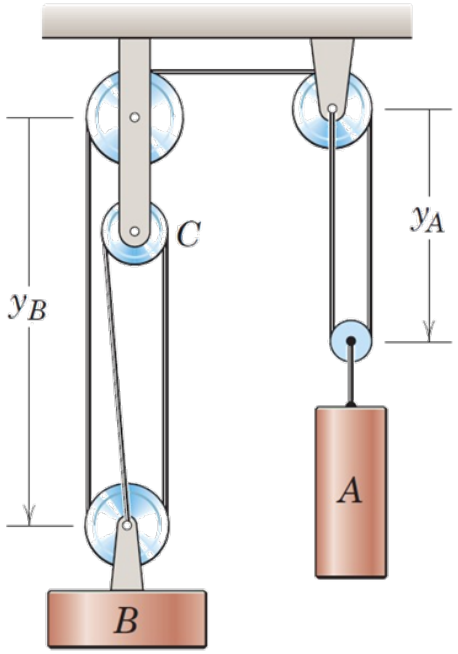


Sample problem 2/15

In the pulley configuration shown, cylinder *A* has a downward velocity of 0.3 m/s. Determine the velocity of *B*.



Sample problem 2/15



Sample problem 2/16

The tractor A is used to hoist the bale B with the pulley arrangement shown. If A has a forward velocity v_A, determine an expression for the upward velocity v_B of the bale in terms of x.