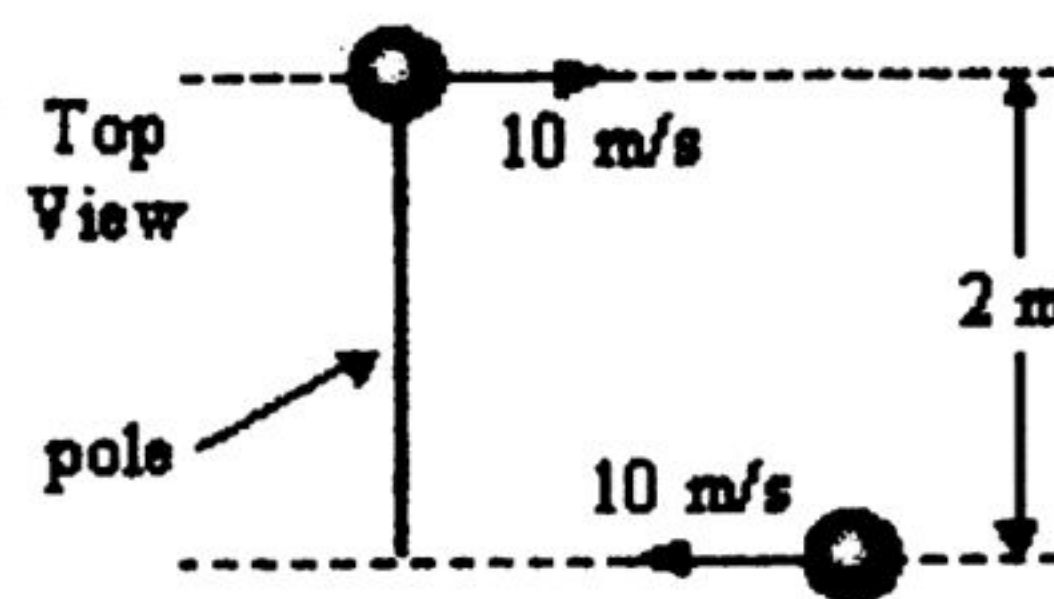


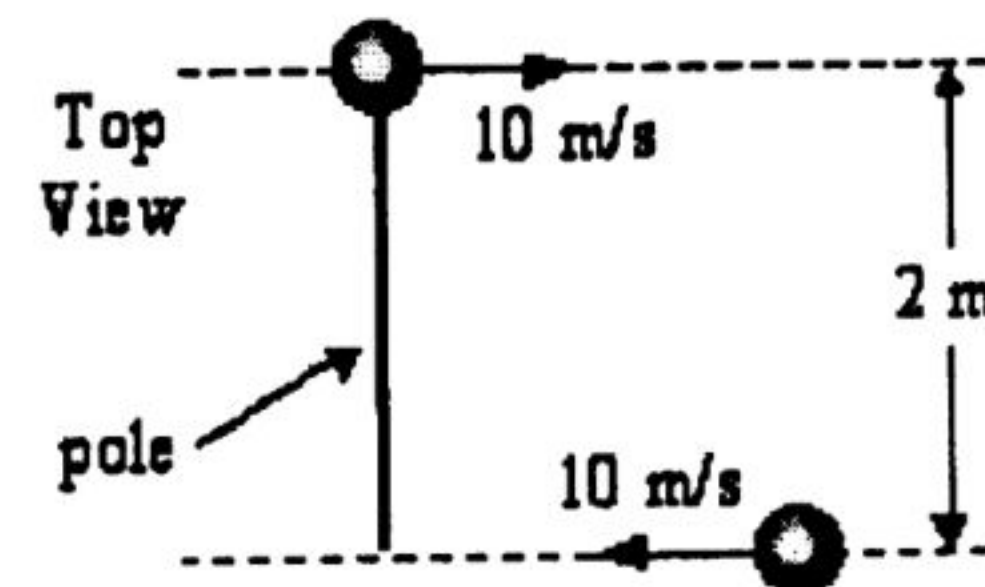
Mechanics

3. Two skaters, each of mass 40 kg, approach each other along parallel paths that are separated by a distance of 2 m. Both skaters have a speed of 10 m/s. The first skater carries a 2-m pole that may be considered massless. As he passes the pole, the second skater catches hold of the end. The two skaters then go around in a circle about the center of the pole. Calculate the angular speed of the skaters after they have linked together.



ANSWER: 5 rad/s

PROBLEM 3. Two skaters, each of mass 40 kg, approach each other along parallel paths that are separated by a distance of 2 m. Both skaters have a speed of 10 m/s. The first skater carries a 2-m pole that may be considered massless. As he passes the pole, the second skater catches hold of the end. The two skaters then go around in a circle about the center of the pole. Calculate the angular speed of the skaters after they have linked together. ANSWER: 5 rad/s



Let $d = 1\text{ m}$ be half the pole length. Using conservation of angular momentum, L , we have (with respect to the center of mass) $L = 2dmv = I\omega$. Here $I = 2md^2$ is the moment of inertia of the two skaters with respect to the center of the pole. Then $\omega = v/d = 10\text{ rad/s}$.