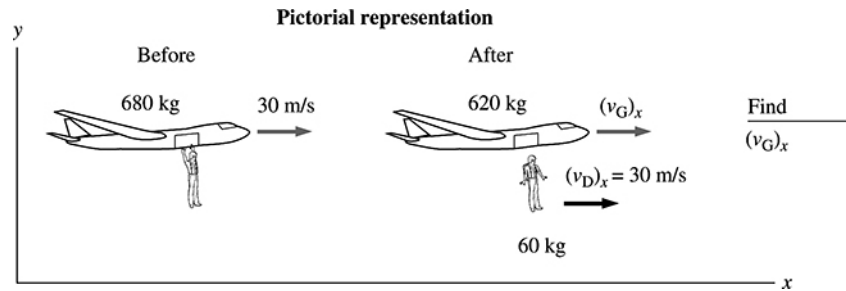


9.16. Model: Choose skydiver + glider to be the system in the impulse approximation.

Visualize:



Note that there are no *external* forces along the x -direction (ignoring friction in the impulse approximation), implying conservation of momentum along the x -direction.

Solve: The momentum conservation equation $p_{ix} = p_{ix}$ is

$$(680 \text{ kg} - 60 \text{ kg})(v_G)_x + (60 \text{ kg})(v_D)_x = (680 \text{ kg})(30 \text{ m/s})$$

Immediately after release, the skydiver's horizontal velocity is still $(v_D)_x = 30 \text{ m/s}$. Thus

$$(620 \text{ kg})(v_G)_x + (60 \text{ kg})(30 \text{ m/s}) = (680 \text{ kg})(30 \text{ m/s}) \Rightarrow (v_G)_x = 30 \text{ m/s}$$

Assess: The skydiver's motion in the vertical direction has *no* influence on the glider's horizontal motion.