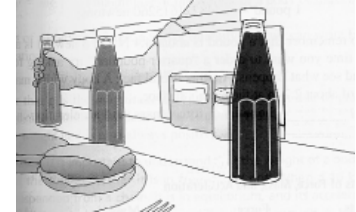


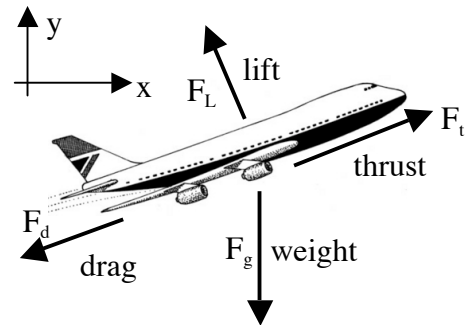
1. The man at the right pushes a 15.0kg wheelbarrow at a constant speed for a distance of 5.00m. The normal force that the ground exerts on the wheel is 80.0N and the frictional force that the ground exerts on the wheel is 25.0N. Find (a) the magnitude and direction of the force exerted by the man on the wheelbarrow, (b) the work done by each force on the wheelbarrow, and (c) the total work done on the wheelbarrow. Explain your answer to part c.



2. A fellow diner at the dorms shoves a 0.450kg bottle of ketchup along the table toward you. As the bottle leaves her hand, it is moving at 2.80m/s. It slides 1.00m before coming to rest in front of you. Find (a) the magnitude and direction of each force acting on the bottle while it is in motion, (b) the work done by each force, and (c) the total work done. Explain your answer to part c.



3. A simplified model of the dynamics of a 50.0kN airplane is shown at the right. It consists of four forces; the weight (F_g), the forward thrust due to the engines (F_t), the drag of air resistance (F_d), and the lift from the wings (F_L). The four force vectors are given in kiloNewtons as, $\vec{F}_g = -50.0\hat{j}$, $\vec{F}_t = 4.33\hat{i} + 2.50\hat{j}$, $\vec{F}_d = -2.60\hat{i} - 1.50\hat{j}$, and $\vec{F}_L = -30.0\hat{i} + 52.0\hat{j}$. Find the component of (a) the weight along the lift, (b) the weight along the drag, (c) the thrust along the lift, and (d) the thrust along the drag.



4. A beach ball is dropped from the top of Whitney Hall. The graph at the right shows the force of air resistance versus the distance the ball has fallen. Find the work done by the force of air resistance (a) between 1.0m and 1.2m, and (b) between 0 and 1.0m.

