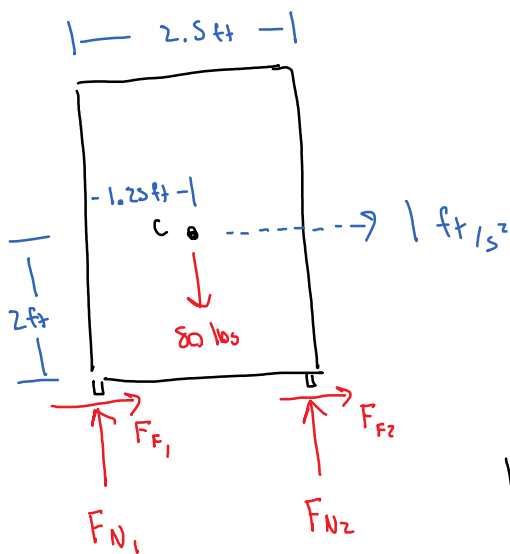
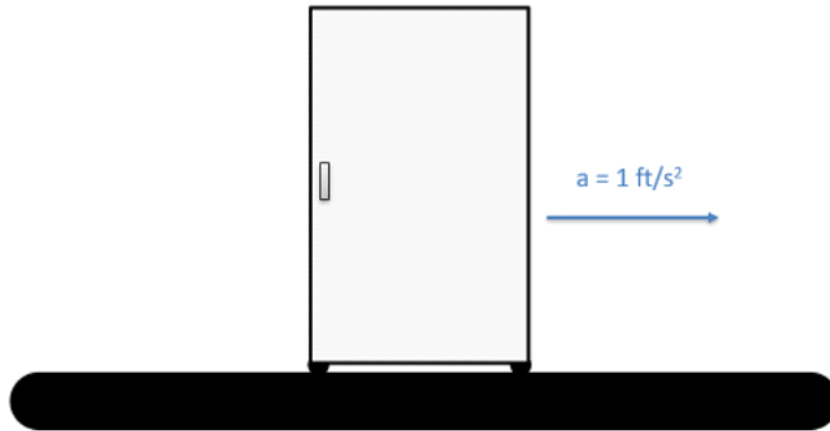


Problem 1

A refrigerator is 2.5 feet wide, 6 feet tall and weighs 80 lbs. The center of mass is 1.25 feet from either side and 2 feet up from the base. If the refrigerator is on a conveyor belt that is accelerating the fridge at a rate of 1 ft/s^2 , what are the normal forces at each of the feet?



$$\sum F_x = F_{F1} + F_{F2} = \left(\frac{80}{32.2}\right) (1 \text{ ft/s}^2)$$

$$\sum F_y = F_{N1} + F_{N2} - 80 = 0$$

$$\sum M_c = (F_{F1} + F_{F2})(2) - (F_{N1})(1.25) + (F_{N2})(1.25) = 0$$

$$F_{F1} + F_{F2} = 2.48 \text{ lbs (can't separate)}$$

$$F_{N1} = 80 - F_{N2}$$

$$(2.48)(2) - (80 - F_{N2})(1.25) + (F_{N2})(1.25) = 0$$

$$4.97 - 100 + 1.25F_{N2} + 1.25F_{N2} = 0$$

$$F_{N2} = 38.01 \text{ lbs}$$

$$F_{N1} = 41.99 \text{ lbs}$$