

3. The air inside pushes outward with a force given by  $p_i A$ , where  $p_i$  is the pressure inside the room and  $A$  is the area of the window. Similarly, the air on the outside pushes inward with a force given by  $p_o A$ , where  $p_o$  is the pressure outside. The magnitude of the net force is  $F = (p_i - p_o)A$ . Since  $1 \text{ atm} = 1.013 \times 10^5 \text{ Pa}$ ,

$$F = (1.0 \text{ atm} - 0.96 \text{ atm})(1.013 \times 10^5 \text{ Pa/atm})(3.4 \text{ m})(2.1 \text{ m}) = 2.9 \times 10^4 \text{ N} .$$