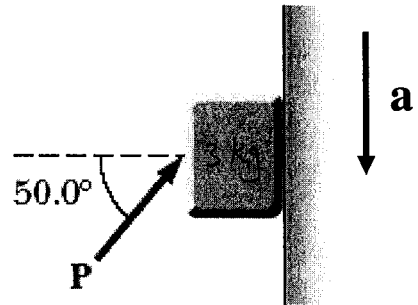
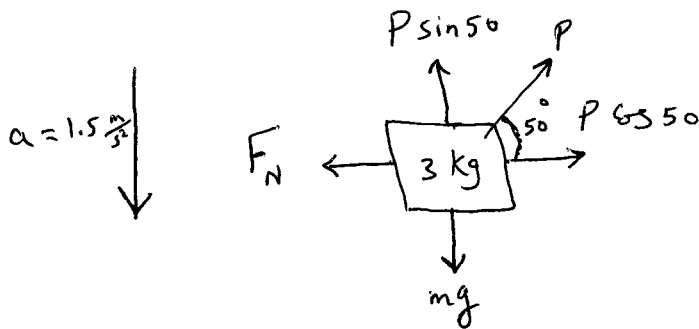


Name: \_\_\_\_\_

Key

ID # \_\_\_\_\_

A block of mass 3.00 kg is pushed up against a wall by a force  $\mathbf{P}$  that makes a  $50.0^\circ$  angle with the horizontal as shown in the figure. The wall is frictionless. a) Determine the value of the force  $\mathbf{P}$  that allows the block to accelerate at a rate of  $1.5 \text{ m/s}^2$  downward. b) Calculate the value of the normal force exerted by the wall on the block.



$$a) \quad \sum F_y = ma_y$$

$$P \sin 50 - mg = -ma$$

$$P = \frac{mg - ma}{\sin 50} = \frac{3(9.8 - 1.5)}{\sin 50} = \boxed{32.5 \text{ N}}$$

$$b) \quad \sum F_x = ma_x$$

no acceleration horizontally.

$$P \cos 50 - F_N = 0$$

$$F_N = P \cos 50 = 32.5 \cos 50 = \boxed{20.9 \text{ N}}$$