

Chris K-F's Method

2) A box slides down a 36.5° ramp with an acceleration of 1.41 m/s^2 . Determine the coefficient of kinetic friction between the box and the ramp. Use a system of equations to cancel out mass.

$$F = ma$$

$$a = \frac{F}{m}$$

$$1.41 = \frac{F}{m}$$

$$1.41 = \frac{F_{\text{net},x}}{m}$$

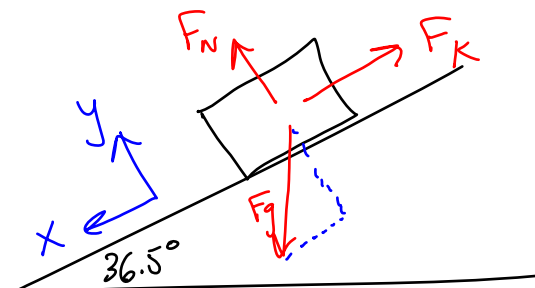
$$1.41 = \frac{F_{gx} - F_k}{m}$$

$$1.41 = \frac{5.84m - F_k}{m}$$

$$1.41m = 5.84m - F_k$$

$$\boxed{F_k = 4.43m}$$

$$\mu_k = \frac{F_k}{F_N} = \frac{4.43m}{7.89m} = \boxed{.561}$$



$$F_{\text{net},x} = F_{gx} - F_k \neq 0$$

$$F_{\text{net},y} = F_N - F_{gy} = 0$$

$$F_N = F_{gy}$$

$$F_g = mg$$

$$F_{gx} = mg \sin \theta$$

$$F_{gx} = 5.84(m)$$

$$F_{gy} = 7.89(m) = F_N$$