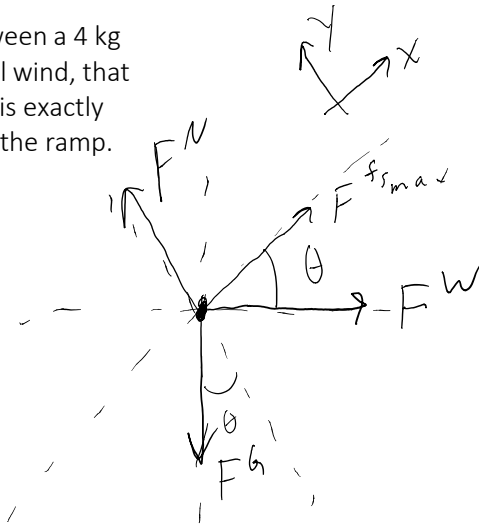
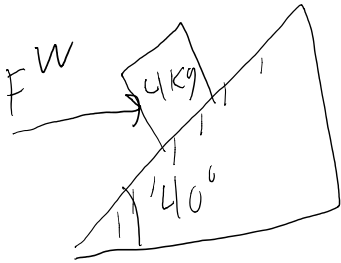


What is the coefficient of static friction between a 4 kg box and a 40 degree ramp when a horizontal wind, that applies 30 N of force parallel to the ground, is exactly enough to keep the box from slipping down the ramp.



$$\sum F_x = m a_x$$

$$F_x^W + F^{f_{smax}} - F_x^G = m a_x$$

$$F^{f_{smax}} = \mu_s F^N$$

$$F^W \cos \theta + \mu_s F^N - m g \sin \theta = 0$$

$$\mu_s F^N = m g \sin \theta - F^W \cos \theta$$

$$\mu_s = \frac{m g \sin \theta - F^W \cos \theta}{F^N} = \frac{m g \sin \theta - F^W \cos \theta}{m g \cos \theta - F^W \sin \theta}$$

$$\mu_s = 0.206$$

$$\sum F_y = m a_y$$

$$F_y^W + F^N - F_y^G = m a_y$$

$$F^W \sin \theta + F^N - m g \cos \theta = 0$$

$$F^N = m g \cos \theta - F^W \sin \theta$$