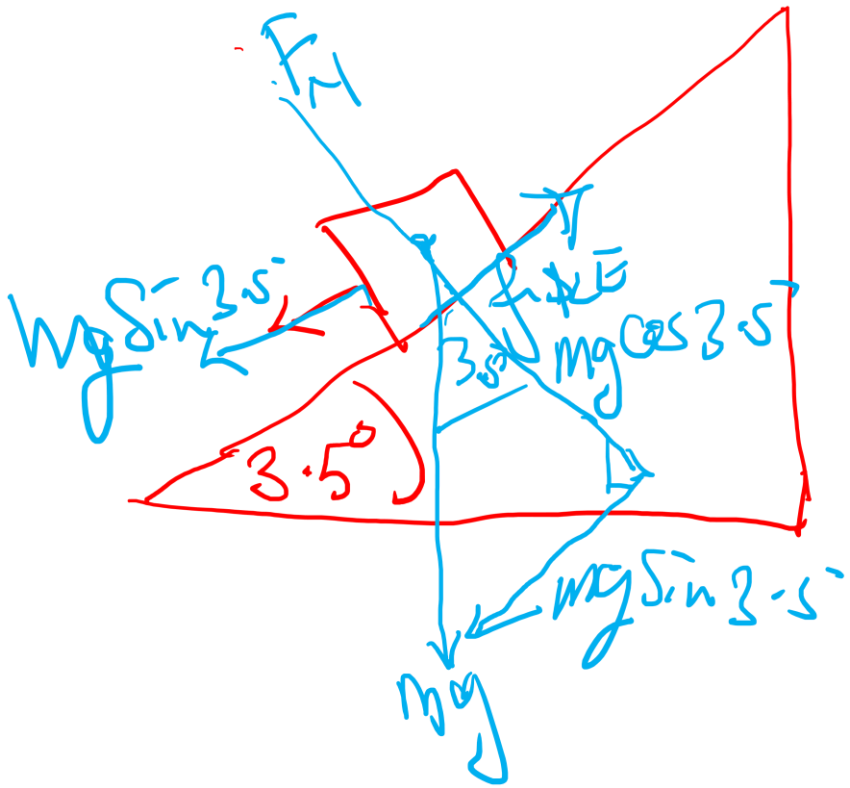
2. A skier coasts down a 3.5° slope at a constant speed. Find the coefficient of kinetic friction between the skis and the snow covering the slope. (0.061)



$$F = ma$$

$$mg\sin 35 - f_{KE} = ma$$

$$f_{KE} = \mu_{KE} F_N$$

$$F_N = mg\cos\theta$$

$$mg\sin 35^\circ - \mu_{KE} mg\cos 35^\circ = ma$$

$a = 0$, constant speed in $\Rightarrow \frac{v-u}{t}$

$$mg\sin 35^\circ - \mu_{KE} mg\cos 35^\circ = 0$$

$$mg\sin 3.5 = \mu_{KE}\, mg\cos 3.5$$

$$\mu_{KE} = \frac{mg\sin 3.5}{mg\cos 3.5}$$

$$\mu_{KE} = \frac{\sin 3.5}{\cos 3.5}$$

$$\tan\theta = \frac{\sin\theta}{\cos\theta} \quad \frac{\sin 3.5}{\cos 3.5} = \frac{0.061}{0.9981} = 0.062$$

$$\mu_{KE} = \tan 3.5$$

$$\mu_{KE} = 0.061$$