59. (a) If the skier covers a distance L during time t with zero initial speed and a constant acceleration a, then $L = at^2/2$, which gives the acceleration a_1 for the first (old) pair of skis:

$$a_1 = \frac{2L}{t_1^2} = \frac{2(200\,\text{m})}{(61\,\text{s})^2} = 0.11\,\text{m/s}^2$$

and the acceleration a_2 for the second (new) pair:

$$a_2 = \frac{2L}{t_2^2} = \frac{2(200\,\text{m})}{(42\,\text{s})^2} = 0.23\,\text{m/s}^2\ .$$

(b) The net force along the slope acting on the skier of mass m is

$$F_{\text{net}} = mg\sin\theta - f_k = mg(\sin\theta - \mu_k\cos\theta) = ma$$

which we solve for μ_{k1} for the first pair of skis:

$$\mu_{k1} = \tan\theta - \frac{a_1}{g\cos\theta} = \tan 3.0^\circ - \frac{0.11}{9.8\cos 3.0^\circ} = 0.041$$

and μ_{k2} for the second pair:

$$\mu_{k2} = \tan\theta - \frac{a_2}{g\cos\theta} = \tan 3.0^\circ - \frac{0.23}{9.8\cos 3.0^\circ} = 0.029\ .$$