18. (a) Refer to the figure in the textbook accompanying Sample Problem 6-3 (Fig. 6-5). Replace f_s with f_k in Fig. 6-5(b) and set $\theta = 12.0°$, we apply Newton's second law to the "downhill" direction:

$$mg\sin\theta - f = ma,$$

where, using Eq. 6-12,

$$f = f_k = \mu_k F_N = \mu_k mg\cos\theta.$$

Thus, with $\mu_k = 0.600$, we have

$$a = g\sin\theta - \mu_k\cos\theta = -3.72 \text{ m/s}^2$$

which means, since we have chosen the positive direction in the direction of motion [down the slope] then the acceleration vector points "uphill"; it is decelerating. With $v_0 = 18.0$ m/s and $\Delta x = d = 24.0$ m, Eq. 2-16 leads to

$$v = \sqrt{v_0^2 + 2ad} = 12.1 \text{ m/s}.$$

(b) In this case, we find $a = +1.1$ m/s^2, and the speed (when impact occurs) is 19.4 m/s.