80. (Second problem in **Cluster 1**)

To keep the block stationary, we require $\sum \vec{F} = 0$ (equilibrium of forces), which leads (along the horizontal x axis) to $f_s = 50$ N. Now, we take $f_s = f_{s,\,\mathrm{max}} = \mu_s N$ and find that N must equal $50/0.4 = 125$ N. Equilibrium of forces along the y axis implies $N - mg - F = 0$, so that (with $mg = 98$ N) we must have $F = 27$ N.