

16. To be on the verge of slipping means that the force exerted on the smaller block (at the point of maximum acceleration) is $f_{\max} = \mu_s mg$. The textbook notes (in the discussion immediately after [Eq. 16-7](#)) that the acceleration amplitude is $a_m = \omega^2 x_m$, where ω is the angular frequency ($\omega = \sqrt{k/(m+M)}$ from [Eq. 16-12](#)). Therefore, using Newton's second law, we have

$$ma_m = \mu_s mg \implies \frac{k}{m+M} x_m = \mu_s g$$

which leads to $x_m = 0.22$ m.