26. (a) 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 ($\omega = 2\pi f$ since there are 2π radians in one cycle). Therefore, in this circumstance, we obtain

$$a_m = (2\pi(1000\,\mathrm{Hz}))^2\,(0.00040\,\mathrm{m}) = 1.6 \times 10^4\ \mathrm{m/s^2}\ .$$

(b) Similarly, in the discussion after Eq. 16-6, we find $v_m = \omega x_m$ so that

$$v_m = (2\pi(1000\,\mathrm{Hz}))\,(0.00040\,\mathrm{m}) = 2.5\ \mathrm{m/s}\ .$$

(c) From Eq. 16-8, we have (in absolute value)

$$|a| = (2\pi(1000\,\mathrm{Hz}))^2\,(0.00020\,\mathrm{m}) = 7.9 \times 10^3\ \mathrm{m/s^2}\ .$$

(d) This can be approached with the energy methods of §16-4, but here we will use trigonometric relations along with Eq. 16-3 and Eq. 16-6. Thus, allowing for both roots stemming from the square root,

$$\begin{aligned} \sin(\omega t + \phi) &= \pm\sqrt{1 - \cos^2(\omega t + \phi)} \\ -\frac{v}{\omega x_m} &= \pm\sqrt{1 - \frac{x^2}{x_m^2}}\ . \end{aligned}$$

Taking absolute values and simplifying, we obtain

$$|v| = 2\pi f\sqrt{x_m^2 - x^2} = 2\pi(1000)\sqrt{0.00040^2 - 0.00020^2} = 2.2\ \mathrm{m/s}\ .$$