CORRECTION
Problem 23.10

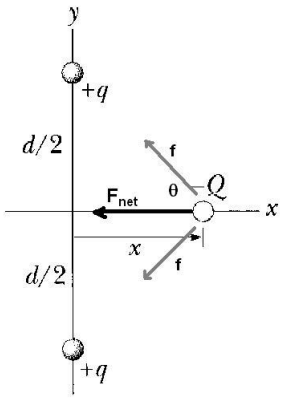

Figure P23.10

For the particle undergoing harmonic oscillation:

$$\frac{d^2x}{dt^2} = -\frac{16kqQ}{md^3} \cdot x$$

with:

$$\omega^2 = \frac{16kqQ}{md^3} \qquad \Rightarrow \qquad T = \frac{\pi}{2}\sqrt{\frac{md^3}{kqQ}}$$

(b) Velocity at the origin is maximum; We can get v_{max} by frequency times amplitude:

$$v_{max} = \omega \; x_{max} = \sqrt{\frac{16kqQ}{md^3}} \cdot a = 4a\sqrt{\frac{kqQ}{md^3}}$$