Question 21562

The amplitude $A = 0.17\,m$, period $T = 0.84\,s$.

By definition, angular frequency $\omega = \dfrac{2\pi}{T} = 7,48\,\dfrac{1}{s}$, and frequency is equal to

$v = \dfrac{1}{T} = 1.19\,\dfrac{1}{s}$.

The expression for displacement is a sine or cosine wave, with given parameters. Let us choose cosine function:

$x(t) = A\cos(\omega t + \delta) = 0.17\cos(7.48\,t + \delta)$.

Velocity and acceleration are first and second derivatives of displacement respectively.

Hence,

Velocity: $v = \dot{x} = -A\omega\sin(\omega t + \delta) = -1.27\sin(7.48\,t + \delta)$, and

Acceleration: $a = \ddot{x} = -A\omega^2\cos(\omega t + \delta) = 9.51\cos(7,48t + \delta)$.