

P2.1-10) The position of a particle moving along a straight line is given by $s(t) = t^2 + 2\sin(\omega t) - 10e^{(t/5)}$ meters, where t is in seconds and $\omega = 6$ rad/s. Determine the particle's velocity and acceleration at $t = 20$ seconds. Is the particle speeding up or slowing down?

Given:

Find:

Solution:

Velocity

Circle the equation the you will use to derive the velocity of the particle.

$$v = \frac{ds}{dt} \quad a = \frac{dv}{dt} \quad ads = vdv$$

$$v(t) = \underline{\hspace{10em}}$$

$$v_{t=20s} = \underline{\hspace{10em}}$$

Acceleration

Circle the equation the you will use to derive the acceleration of the particle.

$$v = \frac{ds}{dt} \quad a = \frac{dv}{dt} \quad ads = vdv$$

$$a(t) = \underline{\hspace{10em}}$$

$$a_{t=20s} = \underline{\hspace{10em}}$$

Is the particle speeding up or slowing down? Why?