P2.1-2) The position of a particle moving along a straight line is given by $s(t) = b\cos(dt + c)$, where t is time and b, c and d are constants. Determine the particle's velocity and acceleration as functions of time and the constants b, c and d. Also, find the maximum velocity of the particle.

Given:

Find:

Solution:

Derive the particle's velocity.

Circle the equation that you will use?

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

$v(t)$ = _____

Derive the particle's acceleration.

Circle the equation that you will use?

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

$a(t)$ = _____

Determine the particle's maximum velocity.

What is the particle's acceleration when the velocity is maximum? Circle the correct answer.

a = maximum, a = 0, a = minimum

Determine the time at which the velocity reaches its maximum value.

t = _____

v_{max}= _____