Quiz 10.2B

1. The position vector \( s(t) \) of a particle moving in the plane is given.

\[ s(t) = (2t^2 + 1, \ln(3t + 4)) \ (1, 1) \]

a) Find the velocity vector of the particle at time \( t = 1 \).

b) Find the speed of the particle at time \( t = 1 \).

c) Find the acceleration vector of the particle at time \( t = 1 \).

2. The velocity function \( v(t) \) of a particle moving in the plane is given, along with the position of the particle at time \( t = 0 \), which is \((1, 2)\).

\[ v(t) = \left( \frac{1}{t^2 + 1}, \frac{1}{t + 1} \right) \]

a) Find the position vector of the particle at time \( t = 3 \).

b) Find the distance the particle travels from \( t = 0 \) and \( t = 3 \).