**Homework H1.G**

Given: Particle P moves in the xy-plane along a path described by $y(x) = bsin(\omega x)$, with $\dot{x} = c$ = constant.

Find:

(a) Determine the velocity and acceleration vectors for P in terms of their Cartesian components as it moves along its prescribed path. Leave your answers in terms of, at most: b, c, ω and x.

(b) For $x = 0.5$ m, determine the rate of change of speed and the radius of curvature for the path of P. Make a sketch of the velocity and acceleration vectors for this position.

(c) For $x = 1$ m, determine the rate of change of speed and the radius of curvature for the path of P. Make a sketch of the velocity and acceleration vectors for this position.

(d) For $x = 0.75$ m, determine the rate of change of speed and the radius of curvature for the path of P. Make a sketch of the velocity and acceleration vectors for this position.
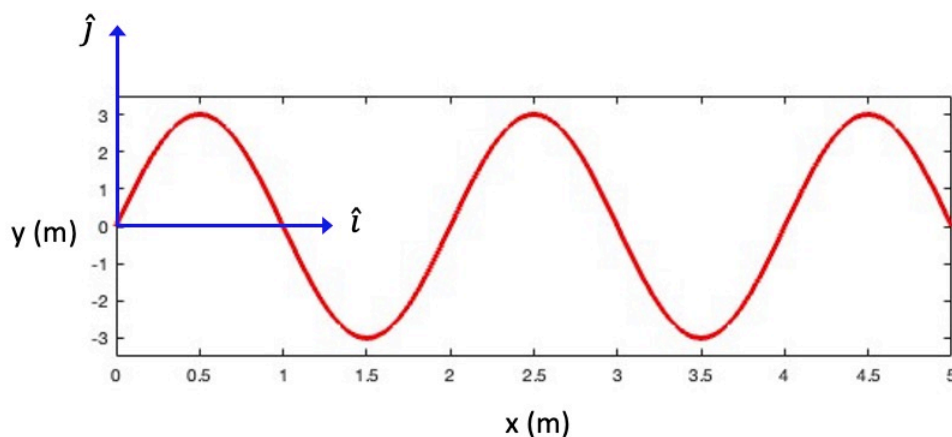
Use the following parameters in your work: $\omega = \pi/m$, $b = 3$ m and $c = 10$ m/s.