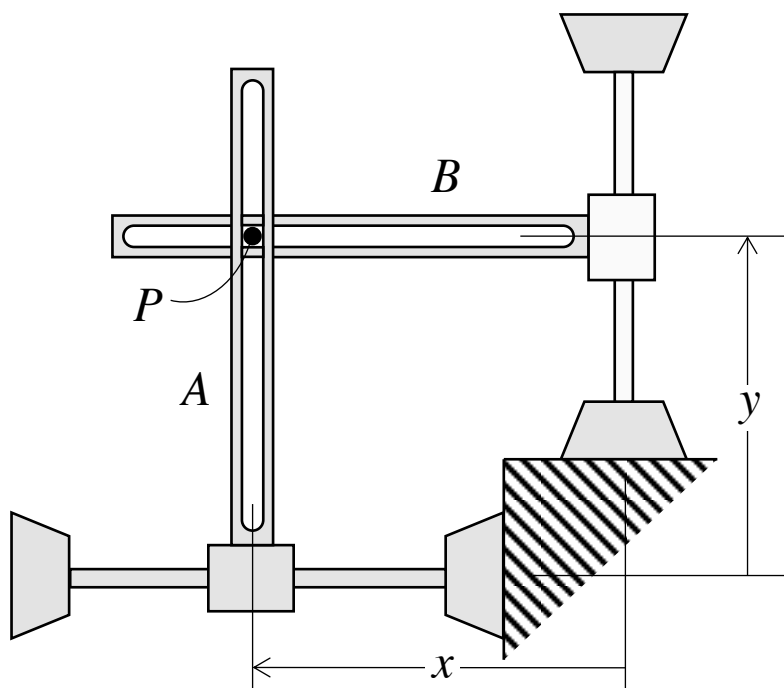


Homework H.1.A

Given: Pin P moves within slots cut into links A and B. The horizontal position of link A is given by $x = 10 + t^2$, whereas the vertical position of link B is given by $y = 15 - t^3$, where t is given in seconds and x and y are given in mm.

Find: Determine the velocity and acceleration of P at $t = 2$ s.



Problem H.1.B

Given: A particle P travels on a path described by the Cartesian coordinates of $y = cx(b - x)$, where x and y have the units of meters. The x -component of velocity, \dot{x} , for P is constant.

Find: For this problem:

- (a) Make a sketch of the path of P over the range of $0 < x < b$.
- (b) Determine the Cartesian components of the velocity and acceleration of P at $x = 0$. Add a sketch of the velocity and acceleration vectors for P to your path drawn above.
- (c) Determine the Cartesian components of the velocity and acceleration of P at $x = b/2$. Add a sketch of the velocity and acceleration vectors for P to your path drawn above.

Use the following parameters in your analysis: $b = 2$ m, $c = 5/\text{m}$ and $\dot{x} = 4$ m/s.