2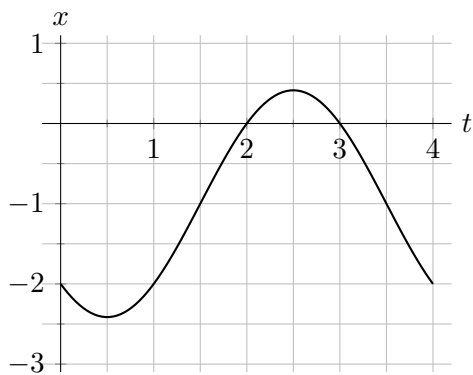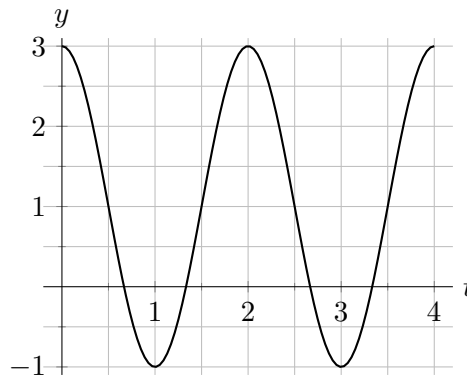. [9 points] A particle travels along the path given by the parametric equations $x = h(t)$ and $y = p(t)$ for $0 \le t \le 4$. Graphs of the functions $h(t)$ and $p(t)$ are shown below.

Graph of $x = h(t)$

Graph of $y = p(t)$

Note: The local minima and maxima of the functions h and p are as they appear in the graphs. In particular, they occur at integer or half-integer values of t.

a. [2 points] In what interval(s) is the particle moving to the left and upwards?
Circle ALL intervals below during which the particle is <u>always</u> moving to the left and upwards. (Circle NONE OF THESE if appropriate.)

$0 < t < 0.5$ $\qquad$ $0.5 < t < 1$ $\qquad$ $1 < t < 1.5$ $\qquad$ $1.5 < t < 2$ $\qquad$ $2 < t < 2.5$

$2.5 < t < 3$ $\qquad$ $3 < t < 3.5$ $\qquad$ $3.5 < t < 4$ $\qquad$ NONE OF THESE

b. [2 points] Find the equations of all horizontal tangent lines to the path of this particle for $0 < t < 4$. Write NONE if there are no horizontal tangent lines.

Answer: _____

c. [5 points] On the axes below, sketch a graph of the path along which the particle moves between time $t = 0$ and $t = 4$.

On your sketch, label the points described below with the corresponding value(s) of t.

- The particle's position at times $t =$ 0, 0.5, 1, 1.5, 2, 2.5, 3, 3.5, and 4.

- The points at which the particle is highest, lowest, farthest right, and farthest left.