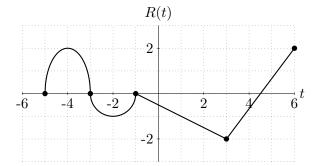**1**. [14 points] The graph of a function $R(t)$ is given below.

$R(t)$

You do not need to show your work on this problem.

a. [3 points] Using **interval** notation, write the t-values where R is increasing and the t-values where R is decreasing.

R is increasing on $\underline{\qquad [-5,-4] \cup [-2,-1] \cup [3,6] \qquad}$

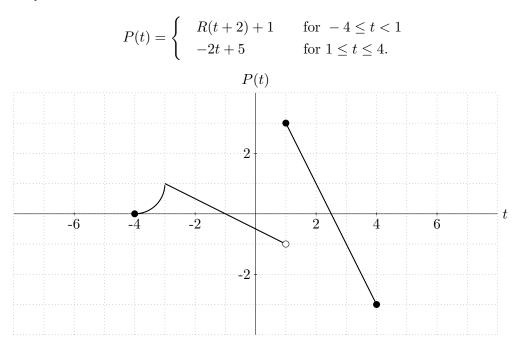R is decreasing on $\underline{\qquad [-4,-2] \cup [-1,3] \qquad}$

b. [3 points] Using **inequalities**, write the t-values where R is concave up and the t-values where R is concave down.

R is concave up for $\underline{\qquad -3 \leq t \leq -1 \qquad}$

R is concave down for $\underline{\qquad -5 \leq t \leq -3 \qquad}$

c. [2 points] Find the average rate of change of R between $t = -2$ and $t = 3$.

The average rate of change is $\underline{\qquad \dfrac{-2-(-1)}{3-(-2)} = -\dfrac{1}{5} \qquad}$

d. [6 points] On the axes below, sketch a well-labeled graph of the piecewise-defined function

$$P(t) = \begin{cases} R(t+2)+1 & \text{for } -4 \leq t < 1 \\ -2t+5 & \text{for } 1 \leq t \leq 4. \end{cases}$$

$P(t)$