8. [8 points] Percy sells tomatoes from his uncle’s farm at the farmer’s market. The following table shows the price \( P(w) \) in dollars he charges for \( w \) pounds of tomatoes.

\[
\begin{array}{c|c|c|c}
  w & 2 & 5 & 10 \\
  P(w) & 5 & 10 & 16 \\
\end{array}
\]

a. [3 points] Find the average rate of change of \( P(w) \) between \( w = 5 \) and \( w = 10 \). Include units.

The average rate of change between \( w = 5 \) and \( w = 10 \) is \( \frac{16 - 10}{10 - 5} = \frac{6}{5} \) dollars per pound.

b. [3 points] Could \( P(w) \) be concave up, concave down, or is neither of these possible? Write your answer in the blank provided, and write one sentence explaining your answer.

\( P(w) \) could be concave down.

\textit{Solution:} \( P(w) \) could be concave down because the average rate of change appears to be decreasing (AROC is \( \frac{5}{3} \) on \( [2, 5] \) and it’s \( \frac{6}{5} \) on \( [5, 10] \)).

c. [2 points] The average rate of change of \( P(w) \) between \( w = 1 \) and \( w = 4 \) is 2. Which of the following is a valid practical interpretation of this average rate of change? Circle your answer.

(i) If a customer purchases between 1 and 4 pounds of tomatoes, the cost, on average, is $2 per pound.

(ii) Each pound of tomatoes purchased between 1 pound and 4 pounds costs $2.

(iii) If a customer is purchasing between 1 and 4 pounds of tomatoes, and she decides to buy a little more, she will be charged, on average, $2 per pound for the additional amount she buys.

(iv) Four pounds of tomatoes, on average, cost $2 more than one pound of tomatoes.