

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.

w	2	5	10
$P(w)$	5	10	16

- 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.

Solution: $P(w)$ could be concave down because the average rate of change appears to be decreasing (AROC is $5/3$ on $[2, 5]$ and it's $6/5$ 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.