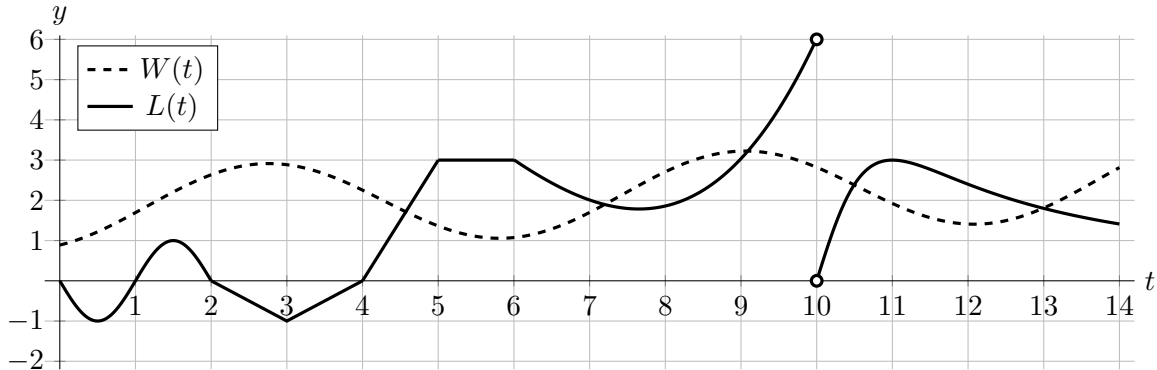


5. [12 points] The Queen of Hearts has welcomed the Cheshire Kid into a poker game at her saloon. Unfortunately, since he joined the games, her luck has been nearly as bad as his. Suppose $W(t)$ gives the rate at which the Queen’s saloon generates profits, and $L(t)$ the rate at which the Queen loses money at poker, both in thousands of dollars per week, t days after the Cheshire Kid joined her poker games. Assume that during these two weeks, profits from the saloon and gains/losses from poker are the only factors affecting the Queen’s wealth. $W(t)$ is the dashed graph and $L(t)$ the solid graph in the figure below.



- a. [2 points] Circle all times t when the Queen was “up” in poker games she played with the Kid, meaning that in the time interval $[0, t]$ she had won more money than she had lost.

$t = 1$ $t = 4$ $t = 6$ $t = 11$ NONE OF THESE

- b. [2 points] Circle all time intervals when the Queen’s wealth was increasing.

$(3, 4)$ $(6, 7)$ $(8, 9)$ $(11, 12)$ NONE OF THESE

- c. [2 points] Circle the time at which the Queen’s wealth was changing the fastest.

$t = 3$ $t = 6$ $t = 10$ $t = 14$ NONE OF THESE

- d. [2 points] Circle the number that gives the best approximation of the total amount of money the Queen *lost* from playing poker between $t = 0$ and $t = 6$.

-\$5,500 -\$3,500 -\$500 \$500 \$3,500 \$5,500

In parts d. and e. below, give your answers in terms of $W(t)$, $L(t)$, their derivatives, and/or definite integrals. Do not attempt to numerically evaluate any expressions in your answers.

- e. [2 points] Write a single expression for the net change (in dollars) in the Queen’s wealth from $t = 0$ to $t = 14$.

Answer: _____

- f. [2 points] Write a single expression for the average rate at which the Queen *lost* money playing poker over the two weeks. *Include units.*

Answer: _____