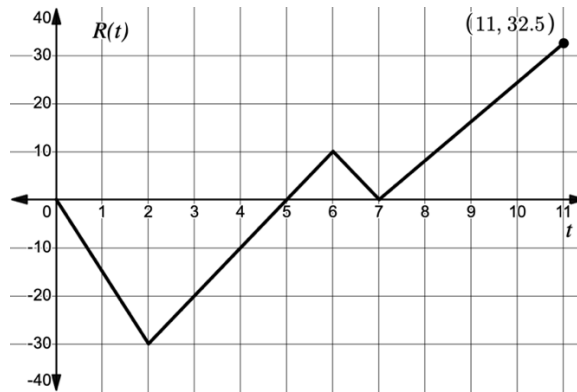




How Many Canoes Are Available?



A canoe rental livery rents out canoes to customers to use on a nearby river. The livery has 80 canoes available. The rate of change of the number of canoes available at the livery on a Saturday can be modeled by the function R for $0 \leq t \leq 11$, where $R(t)$ is measured in canoes per hour, and t is measured in hours since the livery opened. The graph of R is shown.



1. What does it mean in this context if $R(t)$ is below the t -axis?
2. What does it mean in this context if $R(t)$ is above the t -axis?
3. The function C is defined as $C(x) = 80 + \int_0^x R(t) dt$.
 - a. Find $C(0)$. Interpret your answer in the context of this problem.
 - b. Find $C(6)$. Interpret your answer in the context of this problem.
4. Write an equation for $C'(x)$ and find $C'(2)$. Interpret your answer in context.
5. When is the number of canoes available decreasing? How do you know?
6. When is the number of canoes available at a minimum? Justify your answer.
7. When is the number of canoes available increasing at a decreasing rate? Justify your answer.

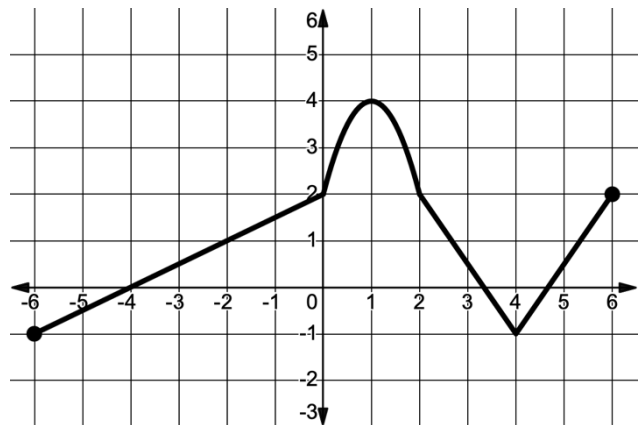
Lesson 6.6 – Justifying Behavior of Accumulation Functions

QuickNotes

Check Your Understanding

1. Let f be a function defined for $-6 \leq x \leq 6$. The graph of f is shown. Let $h(x) = \int_{-4}^x f(t) dt$.

a. Find $h(-2)$, $h'(-2)$, and $h''(-2)$.



b. Find all values of x on the open interval $-6 < x < 6$ where h has a relative minimum. Justify your answer.

c. On which interval(s) is the graph of h concave up? Justify your answer.

d. For which values of x does h have a point of inflection? Justify your answer.

e. For which value of x does the graph of $y = h''(x)$ have an x -intercept? Explain.