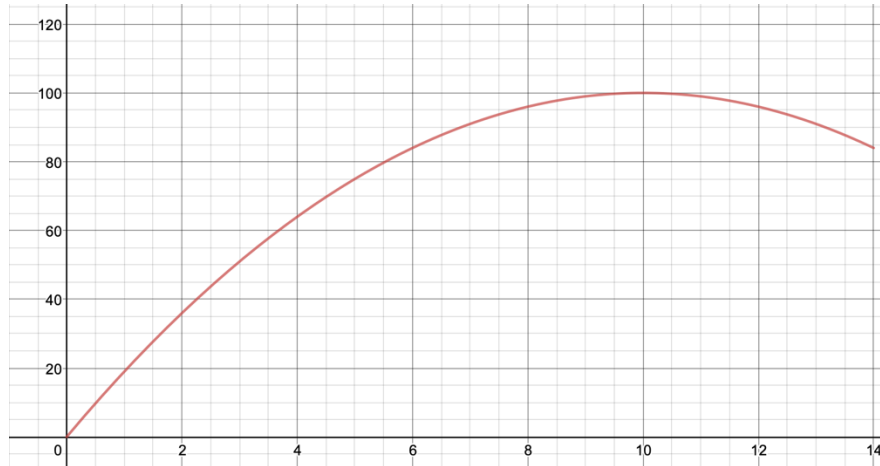




You have just taken over as manager of a struggling umbrella company. Umbrellas are manufactured at a rate given by $G(t) = 20t - t^2$ umbrellas per hour for $0 \leq t \leq 14$, and t represents hours after the factory opens in the morning (6 AM). $G(t)$ is graphed below.



1. After a leisurely breakfast, you arrive at work at 9 AM.
 - a. Write an expression that gives the number of umbrellas that have been produced before you even arrived.
 - b. Roughly how many umbrellas were produced during this time?
2. At 12:30 PM you break for a long lunch.
 - a. Write an expression that gives the number of umbrellas that have been produced that day up until your lunch break.
 - b. Roughly how many umbrellas were produced during this time?
3. Write an equation involving an integral for a function $f(x)$, that gives the number of umbrellas produced x hours after the factory has opened.
4. Find $f'(8)$ and interpret your answer in the context of this problem.
5. When is $f(x)$ changing the fastest? How do you know?

Topic 6.4—Accumulation Functions and the FTC

Important Ideas:

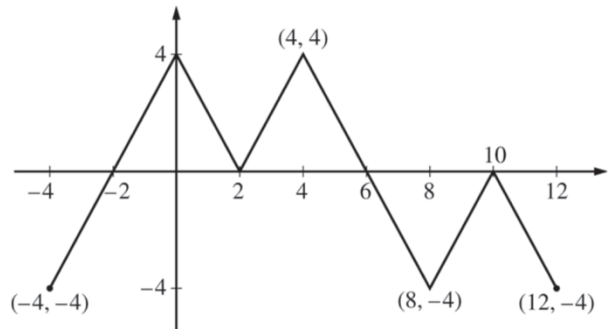
Check Your Understanding!

1. The graph of $f(t)$ is shown below. Let $h(x) = \int_{-2}^x f(t) dt$.

a. Find $h(2)$.

b. Find $h(8)$.

c. Find $h'(x)$.



Graph of f

2. Let $y = \int_8^x \sqrt{2 + e^{3t}} dt$. Find $\frac{dy}{dx}$.

3. Let $g(x) = \int_1^x (3t + 5) dt$

a. Find a formula for $g(x)$ that does not include integrals.

b. Use your answer in part a) to find $g'(x)$.

c. How do parts a) and b) illustrate the Fundamental Theorem of Calculus?