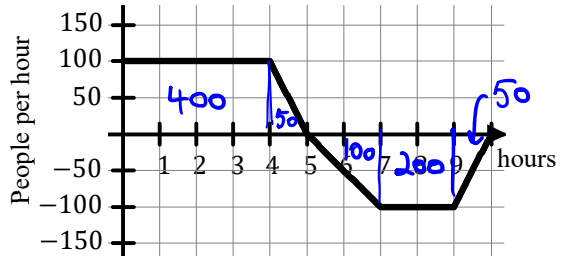
6.1 Accumulation of Change

Calculus

Practice

1. The graph below shows the rate of change for the number of people in a museum t hours after it opens.



a. How many people are in the museum after 5 hours?

400 + 50

450 people

b. How many people are in the museum after 10 hours?

450 − 100 − 200 − 50

100 people

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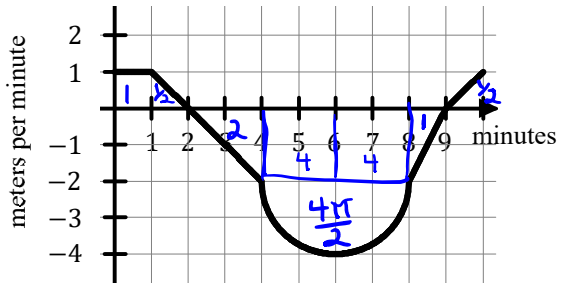
2. The graph below shows the velocity of a particle moving along the x-axis, measured in meters per minute. At $t = 0$ minutes, the particle is at the origin.



a. Where is the particle after two minutes?

1.5 meters to the right

b. Where is the particle after six minutes?

$1.5 - 2 - 4 - \frac{2\pi}{2}$

$-4.5 - \pi$ → negative answer means

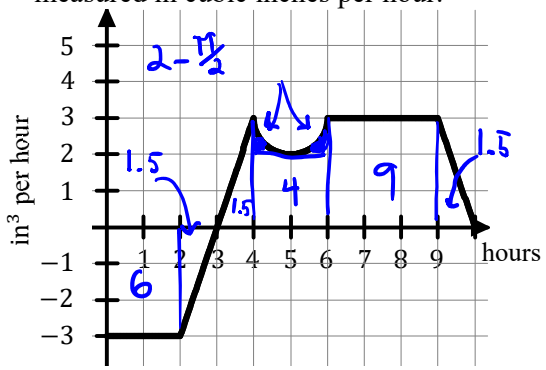
$4.5 + \pi$ meters left

c. Where is the particle after ten minutes?

$1.5 - 2 - 8 - 2\pi - 1 + \frac{1}{2}$

$-9 - 2\pi$ → $9 + 2\pi$ meters to the Left

3. The amount of water in a small pond is changing at the rate modeled in the graph below, where the rate is measured in cubic inches per hour.



a. How much water has been gained/lost during the first three hours?

Lost 7.5 inches^3

b. How much water has been gained/lost after 10 hours?

$-7.5+1.5+4+2-\frac{\pi}{2}+9+1.5$

Gained $10.5-\frac{\pi}{2}$ inches^3

Each function listed represents a rate of change. What are the units for the area under the curve?

4. $f(t)$ is measured in milligrams per year and t is measured in years.

milligrams

5. $g(t)$ is measured in gallons per month and t is measured in months.

gallons

6. $h(t)$ is measured in feet per hour and t is measured in hours.

feet

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Test Prep

7.

The flow of water, in gallons per hour, through a garden house on a hot summer day is given by the graph shown above. Of the following, which best approximates the total number of gallons of water that passed through the garden hose that day?

$8 \cdot 50 \cdot 3$

(A) 400 (B) 800 (C) 1,200 (D) 2,400