

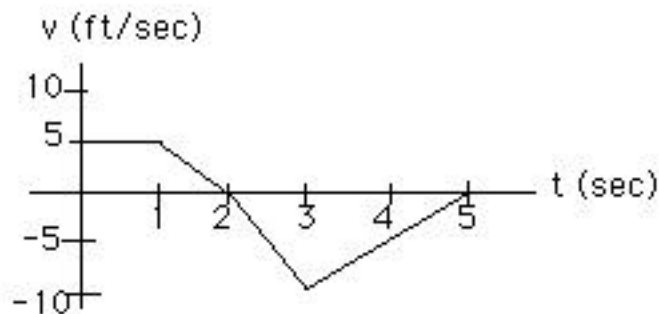
CALCULUS -- Worksheet #66

1996 Free Response (2)

Let R be the region in the first quadrant under the graph of $y = \frac{1}{\sqrt{x}}$ for $4 \leq x \leq 9$.

- Find the area of R.
- If the line $x = k$ divides the region R into two regions of equal area, what is the value of k?
- Find the volume of the solid whose base is the region R and whose cross sections cut by planes perpendicular to the x-axis are squares.

Use the graph shown for Questions 1 – 7. It shows the velocity of an object moving along a straight line during the time interval $0 \leq t \leq 5$.



- The object attains its maximum speed when $t =$ (A) 0 (B) 1 (C) 2 (D) 3 (E) 5
- The speed of the object is increasing during the time interval
(A) (0, 1) (B) (1, 2) (C) (0, 2) (D) (2, 3) (E) (3, 5)
- The acceleration of the object is positive during the time interval
(A) (0, 1) (B) (1, 2) (C) (0, 2) (D) (2, 3) (E) (3, 5)
- How many times on $0 < t < 5$ is the object's acceleration undefined?
(A) none (B) 1 (C) 2 (D) 3 (E) more than 3
- During $2 < t < 3$ the object's acceleration (in $\frac{\text{ft}}{\text{sec}^2}$) = (A) -10 (B) -5 (C) 0 (D) 5 (E) 10
- The object is furthest to the right when $t =$ (A) 0 (B) 1 (C) 2 (D) 3 (E) 5
- The object's average acceleration for the interval $0 \leq t \leq 3$ is $\left(\text{in } \frac{\text{ft}}{\text{sec}^2}\right)$
(A) -15 (B) -5 (C) -3 (D) -1 (E) none of these