

King Fahd University of Petroleum and Minerals
Quiz 1 Math 102-122 Duration 45 minutes

Q 1 If the rate of change of a particle S moving along a straight line is given by $S'(t) = \frac{\sin^{-1}(t/2)}{\sqrt{4-t^2}}$, then find the net change of the particle S during the interval time $[0, 1]$.

Q 2 Let P be a partition of $[0, 1]$. Evaluate

$$\lim_{\|P\| \rightarrow 0} \sum_{k=1}^n \Delta x \sqrt{x_k + 3 + \frac{1}{x_k + 1}}.$$

Q 3 Find $F'(1)$ where

$$F(x) = \int_{-1}^{x^2} \sin\left(\frac{\pi x}{2}\right) \frac{\cos(\pi t)}{t^2 + 1} dt.$$

Q 4 Find the area of the region enclosed by the curves: $y = -x^2 + 1$, $x = -\sqrt{y}$ and the positive part of the x-axis.

Q 5 Rotate the region bounded by the curves $y = \frac{1}{x}$, $y = 0$, $x = 1$, and $x = 3$ about the line $y = 1$. Find the volume of the obtained solid.

Q 6 Rotate the region bounded by the curves $y = x^2 + 1$, $y = -2x$ and $x = 0$ about the line $x = -1$. Find the volume of the obtained solid.