

Show All Set-Ups

1. $\int \sin^3(2x + 3) \cos(2x + 3) dx$

2. $\int \frac{20x+4}{5x^2+2x} dx$

3. Boundaries for the Region R are: $f(x) = x^2 + 3x + 2$, $g(x) = x + 1$, $x = 2$, and $x = 4$.

3a. Find the Area of R

3b. Find the Volume Generated when R is revolved about the line $y = 70$.

3c. Find the Volume Generated when R is revolved about the y-axis.

4. Water is flowing into a tank at the rate of $f(t) = 7 + 3 \sin\left(\frac{5\pi t}{31}\right)$ ft³/min. During this time water is flowing out of the tank at the rate of $e(t) = \frac{16t}{3t+1}$ ft³/min. The time in minutes is on the interval [0,12].

4a. How much water entered the tank on the interval [1, 3]

4b. If 1,250 cubic feet of water were in the tank at $t = 4$, How many cubic feet were in the tank at $t = 1$?

4c. At what time was the water in the tank at a maximum?

4d. What was the maximum amount of water in the tank during the time [0, 12] ?