AP Calculus BC
131

Started In class groups last Friday November 5, 2016

A parabola has vertex at (2, 10) and contains point (5, 2).
Another parabola has vertex at (3, -5) and contains point (6, 12).

Find the area bounded by the 2 graphs.

Solution:
For the 1st parabola:

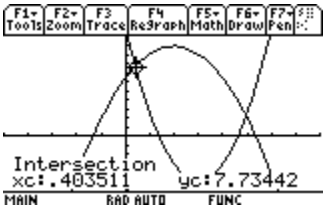
$f(x) = a(x-2)^2 + 10$ Plug in (5, 2) $\rightarrow$ $2 = 9a + 10$ $\rightarrow$ $a = -\frac{8}{9}$

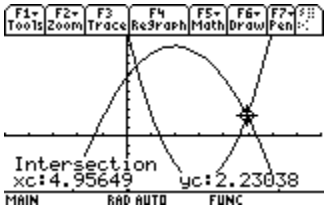
$f(x) = -\frac{8}{9}(x-2)^2 + 10$

For the 2nd parabola:

$g(x) = a(x-3)^2 + 10$ Plug in (6, 12) $\rightarrow$ $9a = 17$ $\rightarrow$ $a = \frac{17}{9}$

$g(x) = \frac{17}{9}(x-3)^2 - 5$





Store 0.40511 in a Store 2.23038 in b

$$\int_a^b (f(x) - g(x))\,dx = \int_a^b \left(\left(-\frac{8}{9}(x-2)^2 + 10\right) - \left(\frac{17}{9}(x-3)^2 - 5\right)\right)dx \approx 43.695089358841 \approx \boxed{43.695}.$$

AP Calculus BC Assignment 131 Monday, November 9, 2015 Hour Name

Find the area bounded by the following.

1. $f(x) = 6x^2 - 3$, $y = x$, $x = 1$, $x = 3$

2. $f(x) = 2 \sin\left(\frac{x}{2}\right)$, $y = 0$, $x = 0$, $x = 2\pi$

3. $f(x) = e^{2x}$, $g(x) = -1$, $x = 0$, $x = 1$

4. Let R be the region enclosed by the graphs of $y = e^x$, $y = (x - 1)^2$, and the line $x = 1$.

a. Find the area of R

b. Find the volume of the solid generated when R is revolved about the x-axis.

c. Set up, but do not integrate, an integral expression in terms of a single variable for the volume of the solid generated when R is revolved about the y-axis.