8.6 Area – More than Two Intersections

Calculus Name: ________________________________

CA #2

The given functions create boundaries for multiple regions.

1. $y = x^3, y = x$

   a. Find x-values of the points of intersection, and label them from smallest to largest as A, B, and C.

   $A =$

   $B =$

   $C =$

   b. Set up integrals

2. $y = -x^3 + 3x^2 - x,\ y = -2x + 1$

   a. Find x-values of the points of intersection, and label them from smallest to largest as A, B, and C.

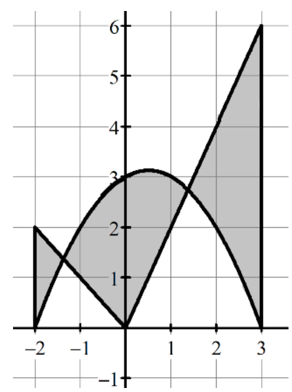
   $A =$

   $B =$

   $C =$

   b. Set up integrals

3. The figure shows the graphs of $y = -x$, $y = 2x$, and $y = 3 + \frac{1}{2}x - \frac{1}{2}x^2$ for $-2 \le x \le 3$. The x-coordinates of the points of intersection of the graphs are x_1 and x_2, where $x_1 < x_2$. Write a sum of integrals that represents the shaded regions. You do NOT need to solve for x_1 and x_2.



Answers to 8.6 CA #2

1a. $A = -1$ $B = 0$ $C = 1$	1b. $\int_{-1}^{0}(x^3 - x)\,dx + \int_{0}^{1}(x - x^3)\,dx$	2a. $A = -0.6751$ $B = 0.4608$ $C = 3.2143$
2b. $\int_{A}^{B}(x^3 - 3x^2 - x + 1)\,dx +$ $\int_{B}^{C}(-x^3 + 3x^2 + x - 1)\,dx$	3. $\int_{-2}^{x_1}\left(\frac{1}{2}x^2 - \frac{3}{2}x - 3\right)dx + \int_{x_1}^{0}\left(3 + \frac{3}{2}x - \frac{1}{2}x^2\right)dx +$ $\int_{0}^{x_2}\left(3 - \frac{3}{2}x - \frac{1}{2}x^2\right)dx + \int_{x_2}^{3}\left(\frac{1}{2}x^2 + \frac{3}{2}x - 3\right)dx$	