Accelerated AB Calculus

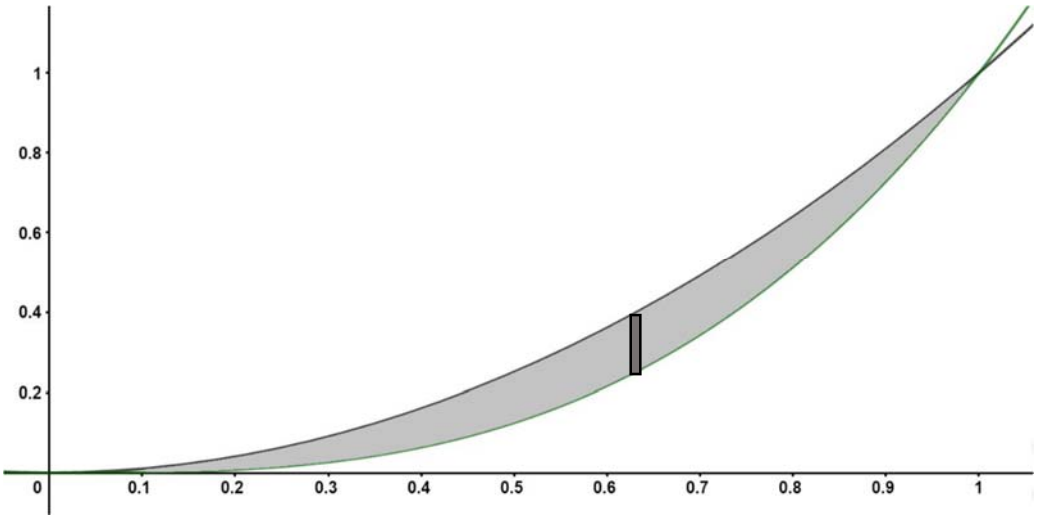
Name_____

6.00 - Area (Between Functions) – Day 2
Horizontal "dy" Rectangles

1. In your homework, you were asked to find the area of the region bounded by the graphs of $y = x^2$ and $y = x^3$.

a. Write the integral you set up to calculate the area, as well the value you got for the area.

b. A rectangle has been drawn that is representative one of the rectangles whose area was summed up to find the integral in part a, label the width and height of this rectangle.

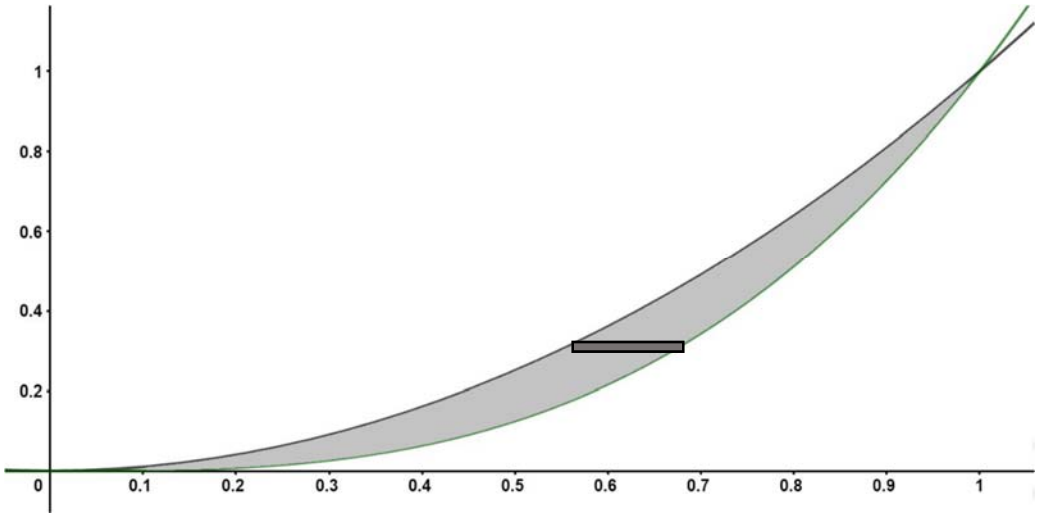


2. We can also find the area of the region bounded by the graphs of $y = x^2$ and $y = x^3$ by using rectangles that are oriented **horizontally** drawn below.

a. What are the width (the skinny part) of each of these rectangles?

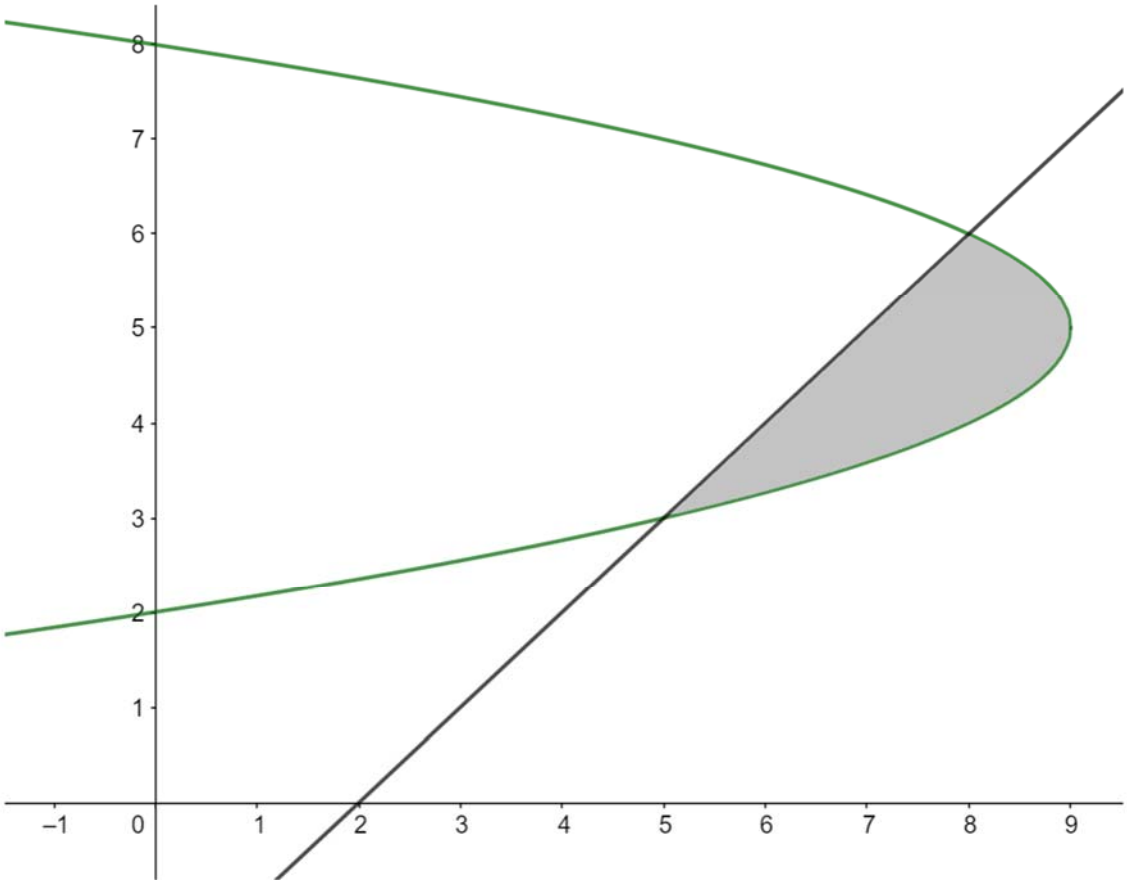
b. What are the lengths of each of these rectangles?

c. Set up an integral representing the summation of the areas of many, many of these skinny horizontal rectangles.



While in the above example, one could use **either vertical (dx) or horizontal (dy)** rectangles to calculate the area of a bounded region, in some cases you can only use horizontal (dy) rectangles… as in the example below.

3. Graphed below is a region bounded by the graphs of $y = x - 2$ and $9 - (y-5)^2 = x$.



a. Why can we **NOT** use **vertical (dx)** rectangles in this case?

b. Find the **y-values** of the intersections of $y = x - 2$ and $9 - (y-5)^2 = x$.

c. Draw an example horizontal (dy) rectangle, label the width and the length both in terms of y.

d. Set up an integral to find the **area** of the region bounded by those two graphs.

e. Using your calculator. Evaluate the integral set up in part b.