

Area of a Region Between Two Curves

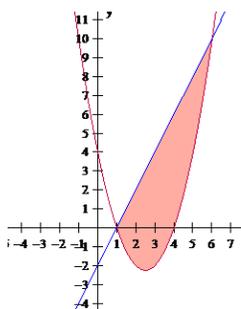
Recall

1. Points of Intersection: $y = x^2 - 2x$ and $y = 7x - 8$
2. Evaluating definite integral: x^2 from 1 to 3
3. Even and Odd Functions and Integrals: x^2 from -2 to 2
4. u-substitution: integral of xe^{x^2-3}
5. Looking up values on unit circle: $\sin(\frac{1}{4}\pi)$
6. Solving trig equations: $\sin x = \frac{1}{2}$
7. Integral of $1/x$ or $1/u$

1. Set up the definite integral that gives the area of the region (similar to p.454 #1-5)

$$y_1 = x^2 - 5x + 4$$

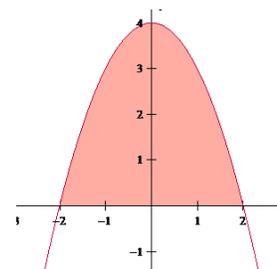
$$y_2 = 2x - 2$$



2. Set up the definite integral that gives the area of the region (similar to p.454 #1-5)

$$y_1 = -x^2 + 4$$

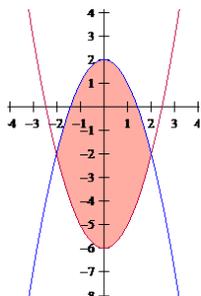
$$y_2 = 0$$



3. Set up the definite integral that gives the area of the region (similar to p.454 #1-5)

$$y_1 = x^2 - 6$$

$$y_2 = -x^2 + 2$$



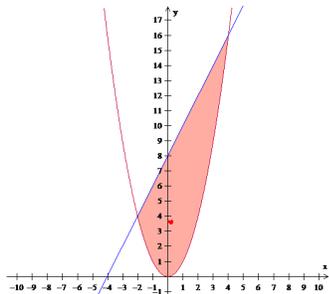
4. The integrand of the definite integral is a difference of two functions. Sketch the graph of each function and shade the region whose area is represented by the integral. (similar to p.454 #7-13)

$$\int_1^4 (x^2 - 4x) - (2x - 5) dx$$

5. Find the area of the region by integrating
a) with respect to x and b) with respect to y
(similar to p.454 #17)

$$y = x^2$$

$$y = 2x + 8$$



6. Sketch the region bounded by the graph
of the algebraic functions and find the area
of the region (similar to p.454 #19-35)

$$y = x^2 - 3, \quad y = -3x + 1, \quad x = -2, \quad x = 0$$

7. Sketch the region bounded by the graph
of the algebraic functions and find the area
of the region (similar to p.454 #19-35)

$$f(x) = x^2 + 8x, \quad g(x) = 0$$

8. Sketch the region bounded by the graph
of the algebraic functions and find the area
of the region (similar to p.454 #19-35)

$$y = x + 1, \quad y = 5 - x, \quad y = 1$$

9. Sketch the region bounded by the graph
of the algebraic functions and find the area
of the region (similar to p.454 #19-35)

$$f(y) = y^2 - 3y, \quad g(y) = -3y + 4$$

10. Sketch the region bounded by the graphs of
the functions, and find the area of the region
(similar to p.454 #47-51) NEXT

$$y = 2 + \sin x, \quad y = 3 - \sin x, \quad \frac{\pi}{6} \leq x \leq \frac{5\pi}{6}$$

11. Sketch the region bounded by the graphs of the functions, and find the area of the region (similar to p.454 #47-51)

$$f(x) = \cot x, \quad g(x) = 1, \quad \frac{\pi}{4} \leq x \leq \frac{3\pi}{4}$$