HOMEWORK DAY 32 – *Substitution §4.5*

1. §4.5: 10

2. §4.5: 14

3. §4.5: 18

4. §4.5: 30

5. §4.5: 32

6. §4.5: 37

7. §4.5: 38

8. §4.5: 41

9. §4.5: 44

10. §4.5: 46

11. §4.5: 47

12. §4.5: 49

13. Sketch the area between the given curves (by hand, as you would on an exam), set up an integral that represents the area and evaluate it.

    (a) $y = x$, $y = 3x - x^2$

    (b) $y = \sqrt{x}$, $y = 1/x^2$, $x = 4$

(c) $x = y^2$, $x = 4y - y^2$

14. In these problems, sketch the region and set up an integral that describes the area. You do not have to evaluate the integral.

    (a) $y = x^3 - 3x$, $y = x$

(b) $y = \cos x$, $y = 2 - \cos x$, $0 \leq x \leq 2\pi$

(c) $y = x^4$, $y = |x|$

15. Set up an integral for the volume of the solids obtained by rotating the given region about the given lines. You do not have to evaluate the integrals, but should know how to if needed.

    In each case, draw the region in the plane that is revolved about an axis, sketch the volume of the solid of revolution, highlight one slice of that volume, and show its radius.

    (a) The region bounded by $y = 1 - 1/x$, $y = 0$, $x = 3$, about the x-axis

    (b) The region bounded by $x = \sqrt{5 - y}$, $y = 0$, $x = 0$, about the y-axis

(c) The region bounded by $8y = x^2$, $y = \sqrt{x}$, about the y-axis

16. Set up an integral for the volumes of the solids obtained by rotating the region bounded by the curves $y = x$ and $y = x^2$ about the given lines. You do not need to evaluate the integral.

Draw the given region in the plane. For each problem, sketch the volume of the solid of revolution, and highlight one slice of that volume, showing its width and its radius.

(a) the x-axis

(b) the y-axis

(c) the line $y = 2$

(d) the line $x = -1$