MATH 16B SEC 5.5 AND 5.7 – EXTRA PROBLEMS

I) IF R IS THE REGION BOUNDED BY THE GRAPHS OF THE EQUATIONS SHOWN BELOW, SET UP (BUT DO NOT EVALUATE) AN INTEGRAL EXPRESSION FOR

a) THE AREA OF R (IN TERMS OF x).

b) THE AREA OF R (IN TERMS OF y).

c) THE VOLUME OF THE SOLID GENERATED BY REVOLVING R AROUND THE X-AXIS.

d) THE VOLUME OF THE SOLID GENERATED BY REVOLVING R AROUND THE Y-AXIS.

---

① $y = \sqrt[3]{x}$ AND $x = 2y^2$

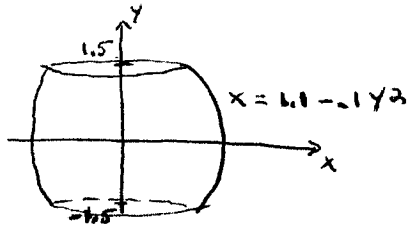
② $y = 2x^2$ AND $y = 6x$

③ $y = 2\sqrt{x}$, $y = 5 - 3x$, AND $y = 0$

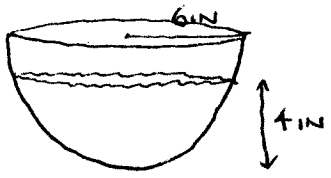
④ $y = e^{3x}$, $y = e^{2x}$, AND $y = 5$

II)

⑤ THE SIDE OF A WINE BARREL IS FORMED BY ROTATING THE PARABOLA $x = 1.1 - .1y^2$ FOR $-1.5 \le y \le 1.5$ AROUND THE Y-AXIS. FIND THE VOLUME OF THE WINE BARREL, IF LENGTH IS MEASURED IN FT. (ROUND YOUR ANSWER OFF TO 1 DECIMAL PLACE.)



⑥ A BOWL HAS THE SHAPE OF THE BOTTOM HALF OF A SPHERE WITH A RADIUS OF 6 IN. IF THE BOWL CONTAINS SOUP WHICH IS 4 IN DEEP, FIND THE VOLUME OF THE SOUP.



⑦ LET R BE THE REGION BOUNDED BY THE GRAPHS OF $y = x^2 - 4$ AND $y = 5$.

a) FIND THE AREA OF R.

b) FIND THE VOLUME OF THE SOLID GENERATED BY REVOLVING R ABOUT THE Y-AXIS.