

APPM 4/5520

Review Problems for Exam II, Sections 5.6-5.7

(Note: Sections 5.6 and 5.7 are about surface area and centers of mass– the resulting integrals in this review may use techniques that appeared later in Chapter 7.)

1. Find the area of the surface generated by revolving the curve $y = \sin x$ for $0 \leq x \leq 2\pi$ about the x -axis.
2. Find the area of the surface generated by revolving the curve $y = x^2$ for $0 \leq x \leq 1$ about the x -axis.
3. Find the area of the surface generated by revolving the curve $y = \ln x$ for $1 \leq x \leq e$ about the line $y = -1$.
4. Find the area of the surface generated by revolving the curve $x = \sqrt{4y - y^2}$ for $1 \leq y \leq 2$ about the y -axis.
5. Find the center of mass of a thin plate of constant density δ bounded by $y = 2\sin(2x)$ and the line $y = 0$ on the interval $0 \leq x \leq \pi/2$.
6. Find the center of mass of a thin plate of constant density δ bounded by the curves $y = x^3$ and $y = \sqrt{x}$.
7. Find the center of mass of a thin plate bounded by the curves $y = 4/\sqrt{x}$ and $y = -4/\sqrt{x}$ and the lines $x = 1$ and $x = 4$ if the plate's density at the point (x, y) is $\delta(x) = 1/x$.
8. Find the center of mass of a thin plate bounded by the curves $y = \sqrt{x}$ and $y = -\sqrt{x}$ and the line $y = x/2$ if the plate's density at the point (x, y) is $\delta(y) = y + 1$.