

1. (5.1,#22) Find the area of the region bounded by $y = |x^2 - 4|$ and $y = \frac{x^2}{2} + 4$.
 2. (5.3,#12) Find the volume of the solid generated by revolving the region bounded $y = 2$, $y = 2 \sin(x)$, $0 \leq x \leq \pi/2$, and the y -axis about the line $y = 2$ using the disk/washer method.
 3. (5.4,#18) Find the volume of the solid generated by revolving the region bounded by $x = 2y - y^2$ and $x = y$ about the x -axis using the shell method.
 4. (5.5,#18) Find the length of the curve $y = \int_{-2}^x \sqrt{3t^4 - 1} dt$, $-2 \leq x \leq -1$.
 5. (5.6,#18) Find the surface area of the surface generated by revolving the curve $x = \frac{y^{3/2}}{3} - y^{1/2}$, $1 \leq y \leq 3$ about the y -axis.
 6. (5.7,#20) Find the center of mass of a thin plate of constant density δ bounded by $y = \sec^2(x)$, $-\frac{\pi}{4} \leq x \leq \frac{\pi}{4}$ and the x -axis.
 7. (6.11,#13) Solve the differential equation: $dy/dx = e^{x-y}$.
 8. (6.11,#31) Solve the differential equation: $\sin(x) \frac{dy}{dx} + \cos(x)y = \tan(x)$, $0 \leq x \leq \pi/2$.
 9. (6.10,#17) Find the derivative of $y = \ln(\sinh(x))$.
 10. (6.10,#46) Evaluate $\int \coth(\theta/\sqrt{3}) d\theta$
 11. (6.10,#55) Evaluate $\int_{-\pi/4}^{\pi/4} \cosh(\tan(\theta) \sec^2(\theta)) d\theta$
 12. (5.5,#11) Find the length of the curve $x = \frac{y^3}{3} + \frac{1}{4y}$ from $y = 1$ to $y = 3$.
(Hint: $1 + (dx/dy)^2$ is a perfect square.)
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