

Workshop Exercises: Applications of the Integral

1. a) Find the area bounded by $y = x^2 - 2$ and $y = x + 4$.
b) Find the area bounded by $y = x^{\frac{1}{3}}$ and $y = \frac{x}{4}$. (Note: this area consists of two regions).
c) Find the area bounded by $x = 2y$ and $y^2 = x + 3$.
d) Find the area bounded by $y = \sin x$, $y = x$, $x = \pi/2$, $x = \pi$.
e) Find the area bounded by $4x^2 + y^2 = 12$, $x = y$.
2. Find the volume of the solid generated by revolving the area bounded by the curves $y = 2x^2$ and $y = x^3$ about
 - a) the x - axis, using the washer method.
 - b) the y - axis, using the shell method.
 - c) the y - axis, using the washer method.
 - d) the line $x = -1$, using the shell method.
3. Find the volume of the solid generated by revolving the area bounded by the curves $x = 2y$ and $y^2 = x + 3$ about the line $y = 4$.
4. Find the volume of the solid generated by revolving the area bounded by the curves $x = (y - 3)^2$ and $x = 4$ about the line $y = 1$.