

Math 272
Applications of Integrations

Solve:

1. Find the area of the region bounded by the graph of $y = 4 - 4x^2$ and the x-axis.
2. Find the area of the region bounded by the graphs of $y = -x^2 + 2x + 3$ and $y = 3$.
3. Find the area of the region bounded by the graphs $y = x^3$ and $y = x$ on the interval $[-1, 1]$.
4. Identify the integral that represents the area of the regions bounded by the graphs of $y = x$ and $y = 5x - x^3$. Just setup the integral.
5. Use the disk method to find the volume formed by revolving the region bounded by the graphs of $y = x^{1/2}$, $y = 0$, and $x = 4$ about the x-axis.
6. Setup the integral which would be used to find the volume generated by revolving the region bounded by the graphs of $y = (x - 2)^{1/2}$, $y = 0$, and $x = 6$ about the y-axis. Use the disk or washer method to setup the integral.
7. Determine the integral to calculate the volume of the solid formed by revolving the region bounded by the graphs $y = x^3$, $y = 1$, and $x = 2$ about the line $x = 2$. Just setup the integral.
8. Consider the region in the first quadrant bounded by the graphs of $y = x^2$, $y = 1$, and the y-axis. Use the shell method to calculate the volume of the solid formed by revolving this region about the line $y = 2$.
9. Setup the integral that represents the arc length of the curve $y = x^{1/2}$ over the interval $[0, 3]$.
10. Find the arclength of the graph of $f(x) = (2/3)(x - 7)^{3/2}$ on the interval $[7, 14]$.
11. Setup the integral that represents the area of a surface formed by revolving the graph of $f(x) = 1 - x^2$ on the interval $[0, 1]$ about the y-axis.
12. A force of 1000 pounds compresses a spring 5 inches from its natural length. Find the work done in compressing the spring 7 additional inches.