

1. A right circular cylinder is to be designed to hold 22 cubic inches of coca-cola (approximately 12 fluid ounces). To keep the costs down, we want to use a minimum of material in the construction. (The volume of a cylinder is given by $V = \pi r^2 h$.) What if the top costs twice as much.
2. A rectangular open tank is to have a square base, and its volume is to be 125 cubic yards. The cost per square yard for the base is \$8 and for the sides is \$4. Find the dimensions of the tank in order to minimize the cost.
3. A box with an open top is to be constructed from a 15" by 24" piece of cardboard by removing equal size squares from each corner and folding the resulting flaps upward. The box with the largest volume will have a height of
4. Solve by horizontal strips only. The area bounded by the curves $y = 2 - x^2$ and $x + y = 0$
5. The area bounded by the lines $y = x$, $x + 2y = 6$ and the x axis is:
6. The volume of the solid generated by revolving about the x -axis the region bounded by the graphs of $y = x^3$, $x = 2$, and the x -axis.
7. What is the volume of revolution from $x = 0$ to $x = \frac{3}{2}$ when the function $f(x) = 2x^2$ is revolved around the y -axis.
8. The radius of a circle is decreasing at a rate of 0.5 cm per second. At what rate, in cm^2 per second, is the circle's area decreasing when the radius is 4 c
9. A spherical ball of ice with an initial radius of 4 inches melts at a rate of 2 in³ per minute. How fast is the radius of the ball decreasing when the radius is 3 inches? ($V = \frac{4}{3}\pi r^3$)
10. The volume of the solid generated by revolving about the x -axis the region bounded by the graphs of $y = \sqrt{x}$, $x = 0$, and $y = 2$.
11. The volume of the solid generated by revolving about the x -axis the region bounded by the graphs of $x = y^2$ and $y = x$.