

1. Find the length of the curve  $y = 2x + 4$  on the interval  $[2, -2]$
2. Find the length of the curve  $y = \frac{x^3}{6} + \frac{1}{2x}$  on the interval  $[1, 2]$
3. Find the length of the curve  $y = x^{1/2} - \frac{1}{3}x^{3/2}$  on the interval  $[1, 3]$
4. Find the length of the curve  $y = \frac{1}{3}x^3 + x^2 + x + \frac{1}{4x+4}$  on the interval  $[0, 4]$
5. Let  $f(x) = \frac{1}{3}x^3$  and let  $R$  be the region bounded by the graph of  $f$  and the  $x$ -axis on the interval  $[0, 2]$ 
  - a) Find the area of the surface generated when the graph of  $f$  on  $[0, 2]$  is revolved about the  $x$ -axis .
  - b) Find the volume of the solid generated when  $R$  is revolved about the  $y$ -axis .
  - c) Find the volume of the solid generated when  $R$  is revolved about the  $x$ -axis .
6. Find the surface area of a cone (excluding the base) with radius 4 and height 8 using integration and a surface area integral.