



2. (9 points) A cylindrical can, open at the top, is to be made from a fixed amount of material,  $300\text{cm}^2$ . Find the radius and height of the can which will give maximum volume.
3. (9 points) The demand equation for a product is  $p = \frac{10}{\sqrt{q}}$ . Use differentials to approximate the revenue  $R(q)$  when 26 units are sold.
4. (9 points) The marginal cost function is given by  $C'(q) = \frac{q}{1+q^2}$ . If the fixed cost is 2000 SR, find the total cost when 10 units are produced.

5. (32 points) Evaluate the following integrals:

a.  $\int \left( \frac{1}{(x-1)^3} + \frac{1}{x-1} \right) dx$

b.  $\int \frac{2^x}{1+2^x} dx$

c.  $\int \frac{(x+1)^2}{\sqrt{x}} dx$

d.  $\int e^{(x^2+\ln x)} dx$

6. (9 points) Find the area between the graph of  $y = 4 - x^2$  and the  $x$  - axis from  $x = 0$  to  $x = 3$ .

7. (9 points) Find the area enclosed by the graphs of  $y = x^2 - x$  and  $y = x + 3$ .