

MA 121 ASSIGNMENT 4

1. Compute

a)  $\int_4^{\infty} x^{-\frac{3}{2}} dx$

b)  $\int_4^{\infty} e^{-3x} dx$

2. Solve:

a)  $y' = 7y^{-2}$ ,  $y = 3$  when  $x = 1$ .

b)  $y' = 2x - xy$

3. Find the volume of the solid formed by revolving the region bounded by

$y = \frac{1}{\sqrt{x}}$ ,  $y = 0$ ,  $x = 1$ ,  $x = 4$  about the x-axis.

4. Given a demand function  $D(x) = (x - 8)^2$  and a supply function  $S(x) = x^2$ , find

a) The equilibrium point

b) The consumer surplus at the equilibrium point

c) The producer surplus at the equilibrium point

5. Let  $z = f(x, y) = e^{3x-2y}$ , find

a)  $f_x(1, 2)$

b)  $f_y(-2, 3)$

c)  $f_{xx}$

d)  $f_{xy}$

e)  $f_{yy}$

6. Let  $f(x, y) = x^2 + 2xy + 2y^2 - 6y + 2$ . Find and identify all relative max's and min's.