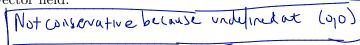
- Compute the integral  $\iint_R \sqrt{4-x^2-y^2} \, dA$ , where R is the region bounded by the function  $x = \sqrt{4 - y^2}$  and the y-axis.
- Find the maximum and minimum values of the function f(x,y,z) = 8x 4z subject to the constraint  $x^2 + 10y^2 + z^2 = 5$ .

• Evaluate the integral  $\int x^2 \cos 3x dx$ .

$$\frac{x^2}{3}$$
 sin 3 x +  $\frac{2}{9}$  (xcos 3 x -  $\frac{1}{3}$  sin 3 x) +C

• Compute the line integral  $\int_C \mathbf{F} \bullet d\mathbf{r}$  where  $\mathbf{F}(x,y) = \langle \frac{-y}{x^2+y^2}, \frac{x}{x^2+y^2} \rangle$  and C is the closed path, the unit circle, parametrized by  $\mathbf{r}(t) = \langle \cos t, \sin t \rangle$ .

• Let  $\mathbf{F}(x,y) = \langle \frac{-y}{x^2+y^2}, \frac{x}{x^2+y^2} \rangle$ . Compute  $\frac{\partial P}{\partial y}$  and  $\frac{\partial Q}{\partial x}$  and then determine if  $\mathbf{F}$  is a conservative vector field.



• Find an equation for the plane that passes through the point (1,2,3) and contains the line x=3t, y = 1 + t, z = 2 - t.

• Find the maximum rate of change of  $f(x, y, z) = \frac{x+y}{z}$  at the point (1, 1, -1).



• Evaluate the integral  $\int (\tan^2 x + \tan^4 x) dx$ .

