KFUPM   **Semester 131**

Dept. Math. &Stat.   **A.Y:2013/2014**

Name: ....

ID: ....

Exercise 1.

Evaluate the area of the surface $z = 2 - x^2 - y^2$ lying above the (x, y) plane. (*Hint*: Use polar coordinates to evaluate the double integral.)

Solution.

Exercise 2.

Verify Stokes' theorem by evaluating both sides of

$$\iint_S (\text{curl } F) \cdot dS = \oint_C F \cdot dr$$

where $F = (2x - y)i - yz^2 j - y^2 z k$ and S is the curved surface of the hemisphere $x^2 + y^2 + z^2 = 16$, $z \geqslant 0$.

Solution.