Progressive Education Society's
Modern College of Arts, Science and Commerce (Autonomous),
Shivajinagar, Pune - 5

Department Of Mathematics
SYBSC (Semester IV) 19ScMatU403

Based on Vector Calculus

Subject : Mathematics Practical-IV (19ScMatU403)
Practical Incharge: Rima Ahuja
Practical 4:Line Integral and Green's Theorem

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1. Evaluate $\int_C x\ dx + y\ dy$ where 'c' is ellipse $x^2 + 4y^2 = 4$.

2. Evaluate $\int_C \bar{u}.d\bar{r}$ from $(0,0,0)$ to$(1,1,1)$ along the path C which consists of line segment from $(0,0,0)$ to $(1,0,0)$ then to $(1,1,0)$ then to $(1,1,1)$,
where $\bar{u} = (3x^2 + 6yz)\ \hat{i} - 14yz\ \hat{j} + 20xz^2\hat{k}$.

3. Verify Green's theorem for $\int_C (3x^2 - 8y^2)dx + (4y - 6xy)dy$, where C is the boundary of the region defined by $x = 0,\ y = 0$ and $x + y = 1$.

4. Using Green's theorem evaluate $\int_C \bar{f}.d\bar{r}$ where $\bar{f} = e^{-x}\sin y\ \hat{i} + e^{-x}\cos y\ \hat{j}$ where C is boundary of rectangle with vertices at $(0,0),\ (\pi,0), \left(\pi, \frac{\pi}{2}\right), \left(0, \frac{\pi}{2}\right)$.

5. Using Green's theorem evaluate $\int_C (x^2 - y)\ dx + x\ dy$, where C is the circle $x^2 + y^2 = 4$.