Q.1: Evaluate the integral $\int_C 2x^3y \, dx + (3x + y) \, dy$, where $C$ is given by $x = y^2$ from $(1, -1)$ to $(1, 1)$.

Q.2: Use Green’s theorem to evaluate the integral $\int_C -3xy \, dx + 2xy^2 \, dy$, where $C$ is the triangle $(1, 3), (3, 3), (3, 9)$. 

Q.3: Show that the integral $\int_{(1,2)}^{(3,6)} (2y^2x - 3) \, dx + (2yx^2 + 4) \, dy$ is independent of path. Find the function $\phi(x, y)$ such that $d\phi = (2y^2x - 3) \, dx + (2yx^2 + 4) \, dy$. Use $\phi(x, y)$ to evaluate the integral.