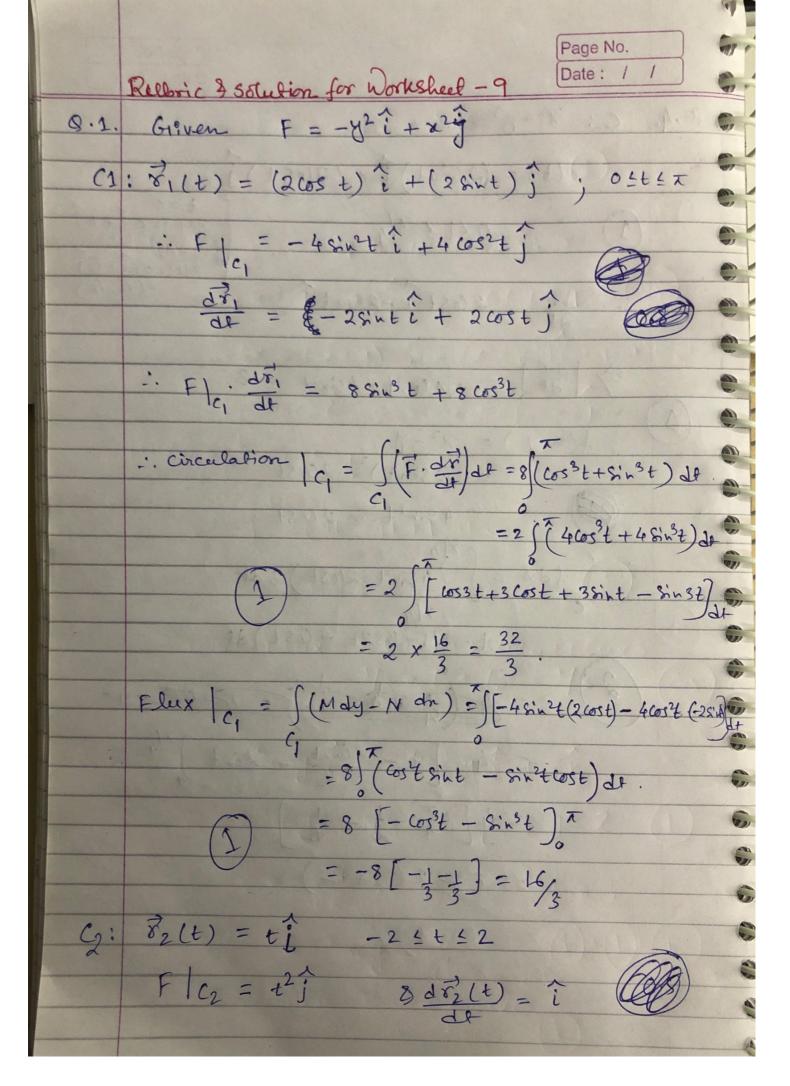
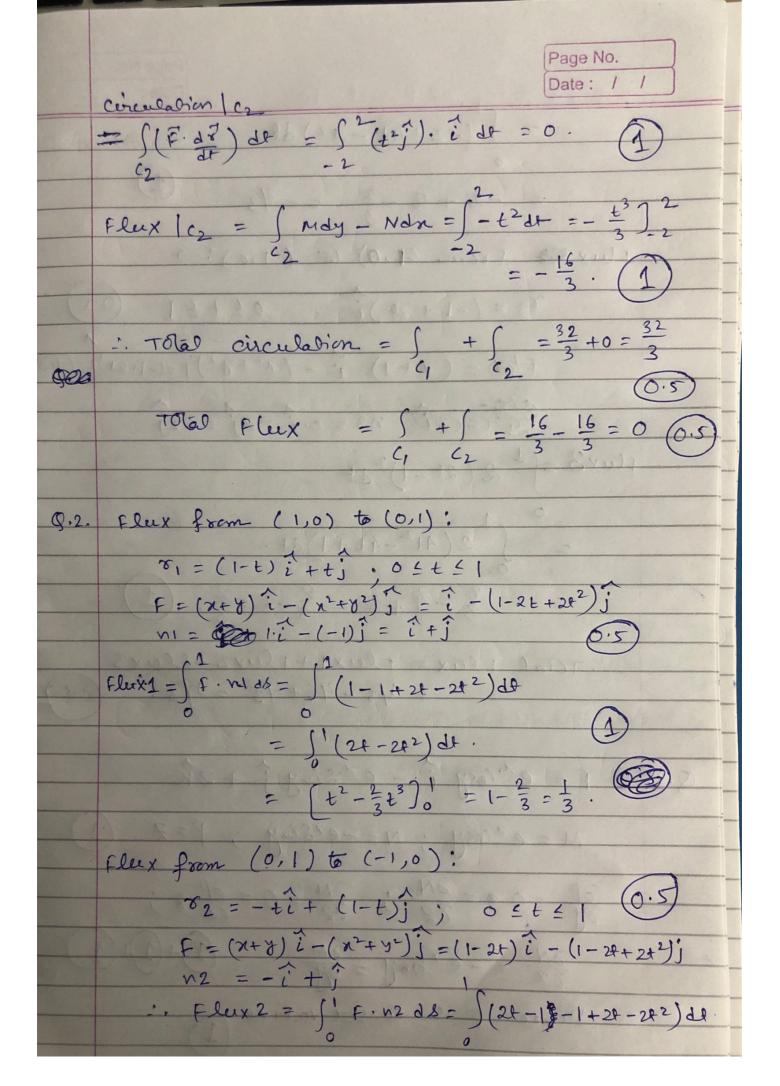
Worksheet-9 Course Name: Math-III (Section-A)

Total marks = 20Date: 23/11/2022

- 1. Find the circulation and flux of the field $\mathbf{F} = -y^2\hat{i} + x^2\hat{j}$ around and across the closed semicircular path that consists of the semicircular arch $r_1(t) = (2\cos t)\hat{i} + (2\sin t)\hat{j}, 0 \le t \le \pi$, followed by the line segment $r_2(t) = t\hat{i}, -2 \le t \le 2$. (5 marks)
- 2. Find the flux of the field $\mathbf{F} = (x+y)\hat{i} (x^2+y^2)\hat{j}$ outward across the triangle with vertices (1,0), (0,1) and (-1,0). (5 marks)
- 3. Verify whether the field $F = (e^x \cos y)\hat{i} (e^x \sin y)\hat{j} + z\hat{k}$ is conservative or not. (5 marks)
- 4. Find a potential function **f** for the field $\mathbf{F} = (\ln x + \sec^2(x+y))\hat{i} + (\sec^2(x+y) + \frac{y}{y^2+z^2})\hat{j} + \frac{z}{y^2+z^2}\hat{k}$ (5 marks)





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