Corto #6 Cálculo Multivariable (15 min)

Nombre: Sección A **Carnet:** ______

1. Evalúe $\int \left(\frac{e^{-t}}{1+e^{-t}} i + t\cos(t) j + t^2 \ln(t) k \right) dt \;=\; I$

$$\int \frac{e^{-t}dt}{1+e^{-t}} = -\int \frac{du}{u} = -\ln|u| + c_1 = \ln|1+e^{-t}| + c_1$$

$u = 1+e^{-t} \qquad du = -e^{-t}dt$

$$\int t\cos t\, dt = t\sin t - \int \sin t\, dt = t\sin t + \cos t + C_2$$

$u = t \qquad dv = \cos t\, dt$

$du = dt \qquad v = \sin t$

$$\int t^2 \ln t\, dt = \frac{1}{3}t^3 \ln t - \frac{1}{3}\int t^2 dt = \frac{1}{3}t^3\ln t - \frac{1}{9}t^3 + C_3$$

$u = \ln t \qquad dv = t^2 dt$

$du = \frac{dt}{t} \qquad v = \frac{1}{3}t^3$

$$\boxed{I = \left\langle \ln|1+e^{-t}| + C_1,\ t\sin t + \cos t + C_2,\ \frac{1}{3}t^3\ln t - \frac{1}{9}t^3 + C_3 \right\rangle}$$

Corto #6 Cálculo Multivariable (15 min)

Nombre: Sección B. Carnet: ____________

1. Evalúe $\int \left(2t(t^2+3)i + t\cos(t)j + \frac{1}{\sqrt{1-t^2}}k\right) dt$ $= I$

$\hat{\imath}$: $\int 2t(t^2+3)\,dt. = \frac{1}{2}(t^2+3)^2 + C_1$

$\int (2t^3+6t)\,dt = \frac{1}{2}t^4 + 3t^2 + C_1$

$\hat{\jmath}$: $\int t\cos t\,dt$: $= t\sin t - \int \sin t\,dt = t\sin t + \cos t + C_2.$

$u = t \qquad dv = \cos t\,dt$

$du = dt \qquad v = \sin t$

$\hat{k}$: $\int \frac{1}{\sqrt{1-t^2}}\,dt = \sin^{-1} t + C_3.$

$I = \left\langle \frac{1}{2}(t^2+3)^2 + C_1,\ t\sin t + \cos t + C_2,\ \sin^{-1} t + C_3 \right\rangle$

ó $\left(\frac{1}{2}(t^2+3)^2 + C_1\right)\hat{\imath} + \left(t\sin t + \cos t + C_2\right)\hat{\jmath} + \left(\sin^{-1} t + C_3\right)\hat{k}$