$$\int x^2 \sin x \, dx$$

S(x^2 sinx)dx = -cosx*x^2 - S(-cosx * 2xdx) = -cosx*x^2 + 2S(cosx * xdx) =
= -cosx*x^2 + 2(x*sinx + cosx+ C) = -cosx*x^2 + 2(x*sinx + cosx)+ 2C

x^2 sinx dx + 2(cosx*x^2 /2 + S(x^2/2 * sinxdx))=x^2 sinx dx + (cosx*x^2 + S(x^2 * sinxdx))
u = x^2
du = 2xdx
dv = sinx dx
v = -cosx

S(cosx * xdx)=cosx*x^2 /2 + S(x^2/2 * sinx)dx
u = cosx
du = -sinxdx
dv = xdx
v = x^2/2

S(cosx * xdx)=xsinx - S(sinx)dx=xsinx + cosx+ C
u = x
du = dx
dv = cosxdx
v = sinx

S(x^2 sinx)dx =x^3/3 * sinx - S(x^3/3)cosx dx
u=sinx
du=cosxdx
dv=x^2dx
v=x^3/3