5) Calcular las siguientes integrales:

a) $\int e^{2x}\,dx = \int e^u \frac{du}{2} = \frac{1}{2}\int e^u\,du = \frac{1}{2}e^u + c = \frac{e^{2x}}{2} + c,\ c\in\mathbb{R}$

$u = 2x$, $du = 2dx$; $u = 2x$

b) $\int 2^x\,dx = \frac{2^x}{\ln(2)} + c,\ c\in\mathbb{R}$

c) $\int \sqrt[3]{33-2x}\,dx = \int u^{1/3}\cdot\frac{du}{-2} = \frac{-1}{2}\int u^{1/3}\,du = \frac{-1}{2}\cdot\frac{u^{4/3}}{4/3} + c$

$= \frac{-1}{2}\cdot\frac{3}{4}u^{4/3} + c$

$= \frac{-3}{8}(33-2x)^{4/3} + c,\ c\in\mathbb{R}$

$u = 33-2x$, $du = -2dx$, $\frac{du}{-2} = dx$

d) $\int \frac{dx}{7-x} = \int \frac{-du}{u} = -\ln|u| + c = -\ln|7-x| + c,\ c\in\mathbb{R}$

$u = 7-x$, $du = -dx$

e) $\int \frac{2x+3}{x^2+3x+4}\,dx = \int \frac{2x+3}{u}\cdot\frac{du}{2x+3} = \ln|x^2+3x+4| + c,\ c\in\mathbb{R}$

$u = x^2+3x+4$, $du = (2x+3)dx$, $\frac{du}{2x+3} = dx$

f) $\int \frac{e^x - e^{-x}}{e^x + e^{-x}}\,dx = \int \frac{e^x - e^{-x}}{u}\cdot\frac{du}{e^x - e^{-x}} = \ln|e^x + e^{-x}| + c,\ c\in\mathbb{R}$

$u = e^x + e^{-x}$, $du = (e^x - e^{-x})dx$, $\frac{du}{e^x - e^{-x}} = dx$

g) $\int \frac{\cos(x)-\operatorname{sen}(x)}{\cos(x)+\operatorname{sen}(x)}\,dx = \int \frac{\cos(x)-\operatorname{sen}(x)}{u}\cdot\frac{du}{\cos(x)-\operatorname{sen}(x)}$

$u = \cos(x)+\operatorname{sen}(x)$, $du = (\cos(x)-\operatorname{sen}(x))dx$, $\frac{du}{\cos(x)-\operatorname{sen}(x)} = dx$

$= \ln|\cos(x)+\operatorname{sen}(x)| + c,\ c\in\mathbb{R}$

h) $\int \frac{1}{\operatorname{sen}^2(x)}\,dx = -\operatorname{cotg}(x) + c,\ c\in\mathbb{R}$