354

| 11. a) $\int \sqrt{x^2-2x}\,(x-1)\,dx =$

ORDEZKATZE METODOA 11/1

$x^2-2x=t^2$

$(2x-2)dx=2t\,dt$

$\cancel{2}(x-1)\,dx=\cancel{2}t\,dt$

$t=\sqrt{x^2-2x}$

$\int \sqrt{t^2}\,t\,dt=\int t^2\,dt=\frac{t^3}{3}+K$

$=\frac{\sqrt{(x^2-2x)^3}}{3}+K$

b) $\int \frac{\arcsin x}{\sqrt{1-x^2}}\,dx=\int t\,dt=\frac{t^2}{2}+K=$

$t=\arcsin x$

$dt=\frac{1}{\sqrt{1-x^2}}\,dx$

$=\frac{(\arcsin x)^2}{2}+K$

c) $\int\sqrt{(1+\cos x)^3}\cdot\sin x\,dx=\int\sqrt{t^3}(-dt)=$

$t=1+\cos x$

$dt=-\sin x\,dx$

$-dt=\sin x\,dx$

$=\int t^{3/2}(-dt)=-\frac{t^{3/2+1}}{3/2+1}+K$

$=-\frac{t^{5/2}}{5/2}+K=-\frac{2}{5}\sqrt{(1+\cos x)^5}+K$

d) $\int \frac{(1+\ln x)^2}{x}\,dx=\int t^2\,dt=\frac{t^3}{3}+K=$

$t=1+\ln x$

$dt=\frac{1}{x}\cdot dx$

$=\frac{(1+\ln x)^3}{3}+K$

e) $\int \frac{2x^2}{(2-x^3)^2}\,dx = \int \frac{2\cdot dt/-3}{t^2} = -\frac{2}{3}\int \frac{dt}{t^2}$

$t = 2-x^3$

$dt = -3x^2dx$

$\frac{dt}{-3} = x^2\cdot dx$

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

$= -\frac{2}{3}\,\frac{t^{-1}}{-1} = \frac{2}{3t} + k = \frac{2}{3(2-x^3)} + k.$

f) $\int \frac{e^x}{\sqrt{1+e^x}}\,dx = \int \frac{dt}{\sqrt{t}} = \int t^{-1/2}dt = \frac{t^{-1/2+1}}{-1/2+1} + k$

$t = 1+e^x$

$dt = e^x\,dx$

$= \frac{t^{1/2}}{1/2} + k = 2\sqrt{t} + k =$

$= 2\sqrt{1+e^x} + k.$