$\boxed{\text{More practice W.S}}$

#1. $u = 4x^4+1 \qquad du = 16x^3\,dx$

$\frac{1}{4}du = 4x^3\,dx$

$\Rightarrow \int \frac{1}{4}\frac{du}{\sqrt{u}} = \frac{1}{4}\cdot 2\sqrt{u} + c = \frac{1}{2}\sqrt{4x^4+1} + c$

#2. $u = \cos\theta \qquad du = -\sin\theta\,d\theta$

$\Rightarrow \int -u^3\,du = -\frac{1}{4}u^4 + c = -\frac{1}{4}\cos^4\theta + c$

#3. $u = \sec x \qquad du = \sec x \cdot \tan x\,dx$

$\Rightarrow \int u^3\,du = \frac{1}{4}u^4 + c = \frac{1}{4}\sec^4 x + c$

#4. $u = x^2-3x+5 \qquad du = (2x-3)\,dx$

$3du = (6x-9)\,dx$

$\Rightarrow \int \frac{3du}{u^3} = -\frac{3}{2}u^{-2} + c = -\frac{3}{2}(x^2-3x+5)^{-2} + c$

$\Rightarrow$ or $\frac{-3}{2(x^2-3x+5)^2} + c$

#5. $u = \ln(x+1) \qquad du = \frac{1}{x+1}\,dx$

$\Rightarrow \int u\,du = \frac{1}{2}u^2 + c = \frac{1}{2}(\ln(x+1))^2 + c$

#6. $u = \ln x \qquad du = \frac{1}{x}\,dx$

$\Rightarrow \int \frac{du}{u^{\frac{1}{3}}} = \int u^{-\frac{1}{3}}\,du = \frac{3}{2}u^{\frac{2}{3}} + c = \frac{3}{2}(\ln x)^{\frac{2}{3}} + c$

#7. $\int\left(\frac{2x}{4x^2} - \frac{5}{4x^2}\right)dx = \int\left(\frac{1}{2x} - \frac{5}{4}x^{-2}\right)dx = \frac{1}{2}\ln|x| + \frac{5}{4}x^{-1} + c$

#8. Look at #11

#9. $u = \sin x + \cos x \qquad du = (\cos x - \sin x)\,dx$

$-du = (\sin x - \cos x)\,dx$

$\Rightarrow \int \frac{-du}{u} = -\ln|u| + c = -\ln|\sin x + \cos x| + C$

#10 $\int \frac{\sin x}{\cos x}\,dx$ $\quad u = \cos x \quad du = -\sin x\,dx$.

$\Rightarrow \int \frac{-du}{u} = -\ln u + c = \boxed{-\ln|\cos x| + c}$ or $\boxed{\ln|\sec x| + c}$

#8

$\Rightarrow$ # 11. $u = 1-5x^2 \quad du = -10x\,dx \Rightarrow -\frac{1}{10}du = x\,dx$

$\Rightarrow \int \sqrt{u}\left(-\frac{1}{10}du\right) = \frac{2}{3}\left(-\frac{1}{10}\right)u^{\frac{3}{2}} + c = \boxed{-\frac{1}{15}(1-5x^2)^{\frac{3}{2}} + c}$

#11. $u = 1+\cos x \quad du = -\sin x\,dx$

$\Rightarrow \int \frac{-du}{u^2} = \frac{1}{u} + c = \boxed{\frac{1}{1+\cos x} + c}$

12 $\quad u = \tan^{-1}x \quad du = \frac{1}{1+x^2}dx$

$\Rightarrow \int u\,du = \frac{1}{2}u^2 + c = \boxed{\frac{1}{2}(\tan^{-1}x)^2 + c}$