$\boxed{\text{Let } c \in \mathbb{R}.}$

11 a) $f(x)=3\cos x-4\sec^2 x$

$\boxed{F(x)=3\sin x-4\tan x+c}$

b) $f(x)=\dfrac{x^{27}-14x^{-1.4}+x^8}{x^3}$

$=x^{24}-14x^{-4.4}+x^5$

$\boxed{F(x)=\frac{1}{25}x^{25}+\frac{14}{3.4}x^{-3.4}+\frac{1}{6}x^6+c}$

c) $f(\theta)=6\theta^2-7\sin\theta$

$\boxed{F(\theta)=2\theta^3+7\cos\theta+c}$

d) $f(x)=6x^{\frac12}-x^{\frac16}$

$F(x)=\frac{2}{3}(6)x^{3/2}-\frac{6}{7}x^{7/6}+c$

$\boxed{F(x)=4x^{3/2}-\frac{6}{7}x^{7/6}+c}$

12) a) $f''(x)=\sin x-x^{\frac12}$

Redo $f'(x)=\underline{-\cos x}-\frac{2}{3}x^{3/2}+c$

$\boxed{f(x)=-\sin x-\frac{2}{3}\left(\frac{2}{5}\right)x^{5/2}+cx+a,\quad c,a\in\mathbb{R}}$

b) $f'(x)=8x^3+12x+3,\ f(1)=6$

$f(x)=\frac{8}{4}x^4+6x^2+3x+c$

$f(1)=2(1)^4+6(1)^2+3(1)+c=6$

$c=6-6-2-3=-5$

$\boxed{f(x)=2x^4+6x^2+3x-5}$

12c) $f'(\theta)=2\cos\theta+\sec^2\theta,\ f(\frac{\pi}{3})=4,\ -\frac{\pi}{2}<\theta<\frac{\pi}{2}$

$f(\theta)=2\sin\theta+\tan\theta+c$

$f(\frac{\pi}{3})=2\sin\frac{\pi}{3}+\tan\frac{\pi}{3}+c=4$

$2\left(\frac{\sqrt3}{2}\right)+\sqrt3+c=4$

$c=4-2\sqrt3$

$\boxed{f(\theta)=2\sin\theta+\tan\theta+4-2\sqrt3}$

12d) $f''(x)=2+\cos x,\ f(0)=-1,\ f(\frac{\pi}{2})=0$

$f'(x)=2x+\sin x+c$

$f(x)=x^2-\cos x+cx+a$

$f(0)=0^2-\cos 0+c(0)+a=-1$

$-1+a=-1$

$a=0$

$f(\frac{\pi}{2})=0:\ \left(\frac{\pi}{2}\right)^2-\cos\frac{\pi}{2}+c\frac{\pi}{2}+0=0$

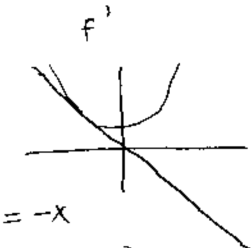
$\frac{\pi^2}{4}-0+c\frac{\pi}{2}=0$

$c=-\frac{\pi^2}{4}\cdot\frac{2}{\pi}=-\frac{\pi}{2}$

$\boxed{f(x)=x^2-\cos x-\frac{\pi}{2}x}$

13) $f'(x)=x^3$ & $x+y=0 \Rightarrow y=-x$ is tangent to the graph.

$f(x)=\frac{x^4}{4}+c$



$y=-x$

$\Rightarrow y-a=-(x+a)$ $\quad y+1=-(x-1)=-x+1 \Rightarrow y=-1$

$\Rightarrow f'(a)=-1 \Rightarrow a^3=-1 \Rightarrow a=-1$

So $f(-1)=1$

$f(-1)=\frac{1}{4}+c=1$

$\Rightarrow c=\frac{3}{4}$

$\boxed{f(x)=\frac{x^4}{4}+\frac{3}{4}}$