ABC II 7288

10.) $g(t)=\sqrt{t}=t^{1/2}$

$g'(t)=\frac{1}{2}t^{-1/2}=\frac{1}{2\sqrt{t}}$

11.) $f(t)=3\tan(t^2)$

$f'(t)=3\sec^2(t^2)\cdot 2t$

$=6t\sec^2(t^2)$

12.) $y=(3x-5)^8$

$y'=8(3x-5)^7(3)$

$=24(3x-5)^7$

13.) $f(\theta)=\theta^4\cos\theta$

$f'(\theta)=4\theta^3\cos\theta+\theta^4\cdot(-\sin\theta)$

$=\theta^3(4\cos\theta-\theta\sin\theta)$

14.) $h(s)=\frac{s^2}{e^s}$

$h'(s)=\frac{2s\cdot e^s-s^2e^s}{(e^s)^2}$

$=\frac{se^s(2-s)}{(e^s)^2}$

$=\frac{s(2-s)}{e^s}$

15.) $f(\theta)=\frac{1-\theta}{\cos\theta}$

$f'(\theta)=\frac{-1\cdot\cos\theta-(1-\theta)(-\sin\theta)}{\cos^2\theta}$

$=\frac{-\cos\theta+(1-\theta)\sin\theta}{\cos^2\theta}$

17) $\frac{1}{3}\int 3\sin(3\theta+2)\,d\theta$

$u=3\theta+2$

$du=3d\theta$

$\frac{1}{3}\int\sin u\,du=-\frac{1}{3}\cos u+C$

$=-\frac{1}{3}\cos(3\theta+2)+C$

18) $\frac{1}{2}\int 2te^{t^2+1}\,dt$

$u=t^2+1$

$du=2t\,dt$

$=\frac{1}{2}\int e^u\,du=\frac{1}{2}e^u+C$

$=\frac{1}{2}e^{t^2+1}+C$

19.) $\int_{-1}^{2}(2x^2+1)\,dx$

$=\left[\frac{2x^3}{3}+x\right]_{-1}^{2}$

$=\frac{2}{3}(2)^3+2-\left(\frac{2}{3}(-1)^3+(-1)\right)$

$=\frac{16}{3}+\frac{6}{3}-\left(-\frac{2}{3}-\frac{3}{3}\right)$

$=\frac{22}{3}+\frac{5}{3}=\frac{27}{3}=9$

20.) $\frac{1}{2}\int_{-\pi/2}^{\pi/2}2\cos(2x)\,dx$

$u=2x$ $\quad x=\frac{\pi}{2}\Rightarrow u=\pi$

$du=2dx$ $\quad x=-\frac{\pi}{2}\Rightarrow u=$

$=\frac{1}{2}\int_{-\pi}^{\pi}\cos u\,du$

$=\frac{1}{2}\sin u\Big]_{-\pi}^{\pi}$

$=\frac{1}{2}(\sin\pi-\sin(-\pi))=0$