$$
\text { Ex: } \begin{aligned}
& u=x^{2} \\
& y=\sin \left(x^{2}\right) \\
& y^{\prime}=\cos \left(x^{2}\right) \cdot 2 x \\
& y^{\prime}=2 x \cos \left(x^{2}\right)
\end{aligned}
$$

$$
\text { (1) n) } \begin{aligned}
y & =\sin (\tan x) \\
y^{\prime} & =\cos (\tan x) \cdot \sec ^{2} x \\
y^{\prime} & =\sec ^{2} x[\cos (\tan x)]
\end{aligned}
$$

$$
\text { (k) } y=\frac{1}{\sqrt{(\sec 2 x-1)^{3}}}=\frac{1}{(\sec 2 x-1)^{3 / 2}}=(\sec 2 x-1)^{-3 /}
$$

$$
y^{\prime}=\frac{-3}{2}(\sec 2 x-1)^{-5 / 2} \cdot \sec 2 x \tan 2 x \cdot(2)
$$

$$
y^{\prime}=\frac{-3 \sec (2 x) \tan (2 x)}{(\sec 2 x-1)^{5 / 2}}
$$

$$
y^{\prime}=\frac{-3 \sec (2 x) \tan (2 x)}{\sqrt{(\sec 2 x-1)^{5}}}
$$

(1)

$$
\begin{aligned}
& \text { 0) } y=\tan ^{2}(\cos x)=[\tan (\cos x)]^{2} \\
& y^{\prime}=2[\tan (\cos x)] \cdot \sec ^{2}(\cos x) \cdot(-\sin x)(1) \\
& y^{\prime}=-2 \sin x[\tan (\cos x)]\left[\sec ^{2}(\cos x)\right]
\end{aligned}
$$

b $y=\frac{x^{2} \tan x}{\underline{\sec x}}=x^{2}\left(\frac{\sin x}{\cos x}\right) \cdot\left(\frac{\cos x}{1}\right)=x^{2} \sin x$

$$
\begin{aligned}
& y^{\prime}=x^{2}(\cos x)(1)+2 x(\sin x) \\
& y^{\prime}=x^{2} \cos x+2 x \sin x \\
& y^{\prime}=x[x \cos x+2 \sin x]
\end{aligned}
$$

Final Review

$$
\begin{aligned}
& \text { (1) b) } f(x)=\frac{2 x-2}{x+3} \quad f(x+h)=\frac{2 x+2 h-2}{x+h+3} \\
& f^{\prime}(x)=\lim _{h \rightarrow 0} \frac{(x+3)(x+h+3)\left(\frac{2 x+2 h-2)}{\frac{x+h+3}{}}-\frac{(2 x-2)}{x+3}\right.}{h(x+3)(x+h+3)(x+h+3)} \\
& =\lim _{h \rightarrow 0} \frac{2 x^{2}+2 x h-2 x+6 x+20,-1-\left(2 x^{2}+2 x h+6 x-2 x-2 h-6\right.}{h(x+3)(x+h+3)} \\
& =\lim _{h \rightarrow 0} \frac{8 k}{k(x+3)(x+h+3)}=\frac{8}{(x+3)^{2}}
\end{aligned}
$$

