(1) $y = \cos^2(x^2+1)$ $\qquad y' = -2\cos(x^2+1)\,\operatorname{sen}(x^2+1)\cdot 2x = \boxed{-4x\cos(x^2+1)\operatorname{sen}(x^2+1)}$

(2) $y = \ln(tg(1-x))$ $\qquad y' = \dfrac{1}{tg(1-x)}\cdot \sec^2(1-x)\cdot(-1) = \dfrac{-\sec^2(1-x)}{tg(1-x)} = \boxed{\dfrac{-1}{\operatorname{sen}(1-x)\cos(1-x)}}$

(3) $y = \dfrac{\operatorname{sen}^2(2x+1)}{\cos(1-x)}$ $\qquad y' = \dfrac{2\operatorname{sen}(2x+1)\cos(2x+1)\cdot 2\cos(1-x) - \operatorname{sen}^2(2x+1)\cdot(-\operatorname{sen}(1-x))\cdot(-1)}{\cos^2(1-x)} =$

$$= \boxed{\frac{\operatorname{sen}(2x+1)\left[4\cos(2x+1)\cos(1-x) - \operatorname{sen}(2x+1)\operatorname{sen}(1-x)\right]}{\cos^2(1-x)}}$$

(4) $y = tg^3(5x)$ $\qquad y' = 3tg^2(5x)\cdot\sec^2(5x)\cdot 5 = \boxed{15\dfrac{\operatorname{sen}^2(5x)}{\cos^4(5x)}}$

(5) $y = \operatorname{sen}\sqrt{\ln(1-3x)}$ $\qquad y' = \cos\sqrt{\ln(1-3x)}\cdot\dfrac{1}{2\sqrt{\ln(1-3x)}}\cdot\dfrac{1}{1-3x}(-3) = \boxed{\dfrac{-3\cos\sqrt{\ln(1-3x)}}{2(1-3x)\sqrt{\ln(1-3x)}}}$

(6) $y = \sec(5x+2)$

$y = \dfrac{1}{\cos(5x+2)}$ $\qquad y' = \dfrac{-(-\operatorname{sen}(5x+2))\cdot 5}{\cos^2(5x+2)} = \boxed{\dfrac{5\operatorname{sen}(5x+2)}{\cos^2(5x+2)}}$

(7) $y = \dfrac{\cos(2x)+\operatorname{sen}(2x)}{\cos(2x)-\operatorname{sen}(2x)}$ $\qquad y' = \dfrac{[-2\operatorname{sen}(2x)+2\cos(2x)][\cos(2x)-\operatorname{sen}(2x)] - [\cos(2x)+\operatorname{sen}(2x)]\cdot[-2\operatorname{sen}(2x)-2\cos(2x)]}{[\cos(2x)-\operatorname{sen}(2x)]^2}$

$$= \frac{2[\cos(2x)-\operatorname{sen}(2x)]^2 + 2[\cos(2x)+\operatorname{sen}(2x)]^2}{[\cos(2x)-\operatorname{sen}(2x)]^2} = \frac{4\cos^2(2x)+4\operatorname{sen}^2(2x)}{\cos^2(2x) - 2\operatorname{sen}(2x)\cos(2x) + \operatorname{sen}^2(2x)} =$$

$$= \boxed{\frac{4}{1-\operatorname{sen}(4x)}}$$

(8) $y = \operatorname{arc\,sen}\dfrac{x+1}{x-1}$ $\qquad y' = \dfrac{1}{\sqrt{1-\left(\frac{x+1}{x-1}\right)^2}}\cdot\dfrac{(x-1)-(x+1)}{(x-1)^2} = \dfrac{1}{\sqrt{\frac{(x-1)^2-(x+1)^2}{(x-1)^2}}}\cdot\dfrac{-2}{(x-1)^2} =$

$$= \frac{1}{\frac{\sqrt{-4x}}{-(x-1)}}\cdot\frac{-2}{(x-1)^2} = \frac{+2}{(x-1)\sqrt{-4x}} = \boxed{\frac{+1}{(x-1)\sqrt{-x}}}$$

(9) $y = \operatorname{arc\,tg}\dfrac{x-1}{1-x}$ $\qquad y' = \dfrac{1}{1+\left(\frac{x-1}{1-x}\right)^2}\cdot\dfrac{(1-x)-(x-1)\cdot(-1)}{(1-x)^2} = \dfrac{1}{1+\left(\frac{x-1}{1-x}\right)^2}\;\dfrac{1-x+x-1}{(1-x)^2} = \boxed{0}$

(10) $y = \cos^2(\operatorname{arc\,sen} x^2)$ $\qquad y' = -2\cos(\operatorname{arc\,sen} x^2)\cdot\operatorname{sen}(\operatorname{arc\,sen} x^2)\,\dfrac{1}{\sqrt{1-x^4}}\cdot 2x =$

$$= -2\sqrt{1-x^4}\cdot x^2\cdot\frac{2x}{\sqrt{1-x^4}} = \boxed{-4x^3}$$

(11) $y = e^{x^2}$ $\qquad y' = e^{x^2}\cdot 2x = \boxed{2x\,e^{x^2}}$

(12) $y = \sqrt[3]{ctg\,x}$ $\qquad y' = \dfrac{1}{3\sqrt[3]{ctg^2x}}\cdot(-\operatorname{cosec}^2 x) = \boxed{\dfrac{-\operatorname{cosec}^2 x}{3\sqrt[3]{ctg^2 x}}}$

(13) $y = \operatorname{arc\,cos}(x^2)$ $\qquad y' = \dfrac{-1}{\sqrt{1-x^4}}\cdot 2x = \boxed{\dfrac{-2x}{\sqrt{1-x^4}}}$

(14) $y = \operatorname{sen}^3\left(\cos\frac{1}{x}\right)$ $\qquad y' = 3\operatorname{sen}^2\left(\cos\frac{1}{x}\right)\cdot\cos\left(\cos\frac{1}{x}\right)\cdot\left[-\operatorname{sen}\left(\frac{1}{x}\right)\right]\cdot\dfrac{-1}{x^2} = \boxed{\dfrac{3\operatorname{sen}^2\left(\cos\frac{1}{x}\right)\cos\left(\cos\frac{1}{x}\right)\operatorname{sen}\left(\frac{1}{x}\right)}{x^2}}$

(15) $y = \ln\sqrt{\frac{1+\sin(2x)}{1-\sin(2x)}}$

$y = \frac{1}{2}\left[\ln(1+\sin(2x)) - \ln(1-\sin(2x))\right]$

$y' = \frac{1}{2}\left[\frac{\cos(2x)\cdot 2}{1+\sin(2x)} - \frac{-\cos(2x)\cdot 2}{1-\sin(2x)}\right] =$

$= \frac{2\cos(2x)}{\cancel{2}}\left[\frac{1}{1+\sin(2x)} + \frac{1}{1-\sin(2x)}\right] =$

$= \cos(2x)\,\frac{1-\cancel{\sin(2x)}+1+\cancel{\sin(2x)}}{(1+\sin(2x))(1-\sin(2x))} = \frac{2\cos(2x)}{1-\sin^2(2x)} =$

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

(16) $y = \operatorname{arctg}\frac{x+1}{1-x}$

$y' = \frac{1}{1+\left(\frac{x+1}{1-x}\right)^2}\,\frac{(1-x)+(x+1)}{(1-x)^2} = \frac{2}{(1-x)^2+(x+1)^2} = \frac{2}{2+2x^2} = \boxed{\frac{1}{1+x^2}}$

(17) $y = \frac{\sqrt{\operatorname{tg}x}}{a^{\sqrt{x}}}$

$\ln y = \frac{1}{2}\ln\operatorname{tg}x - \sqrt{x}\cdot\ln a$

$\frac{y'}{y} = \frac{1}{2}\,\frac{1}{\operatorname{tg}x}\cdot\sec^2 x - \ln a\,\frac{1}{2\sqrt{x}} \Rightarrow y' = \boxed{\left(\frac{\sec^2 x}{2\operatorname{tg}x} - \frac{\ln a}{2\sqrt{x}}\right)\frac{\sqrt{\operatorname{tg}x}}{a^{\sqrt{x}}}}$

(18) $y = \ln\frac{1+\operatorname{tg}\left(\frac{x}{2}\right)}{1-\operatorname{tg}\left(\frac{x}{2}\right)} = \ln\left(1+\operatorname{tg}\frac{x}{2}\right) - \ln\left(1-\operatorname{tg}\frac{x}{2}\right)$

$y' = \frac{\sec^2\frac{x}{2}\cdot\frac{1}{2}}{1+\operatorname{tg}\frac{x}{2}} - \frac{-\sec^2\frac{x}{2}\cdot\frac{1}{2}}{1-\operatorname{tg}\frac{x}{2}} =$

$= \frac{1}{2}\sec^2\frac{x}{2}\left[\frac{1}{1+\operatorname{tg}\frac{x}{2}} + \frac{1}{1-\operatorname{tg}\frac{x}{2}}\right] =$

$= \frac{1}{2}\sec^2\frac{x}{2}\,\frac{1-\cancel{\operatorname{tg}\frac{x}{2}}+1+\cancel{\operatorname{tg}\frac{x}{2}}}{\left(1+\operatorname{tg}\frac{x}{2}\right)\left(1-\operatorname{tg}\frac{x}{2}\right)} =$

$= \frac{\sec^2\frac{x}{2}}{1-\operatorname{tg}^2\frac{x}{2}} = \frac{1}{\cos^2\frac{x}{2}-\sin^2\frac{x}{2}} = \boxed{\frac{1}{\cos x}}$

(19) $y = \sqrt[x]{\sin x} = \sin^{1/x} x$

$\ln y = \frac{1}{x}\ln(\sin x) = \frac{\ln(\sin x)}{x}$

$\frac{y'}{y} = \frac{\frac{1}{\sin x}\cdot\cos x\cdot x - \ln(\sin x)}{x^2} = \frac{x\operatorname{ctg}x - \ln(\sin x)}{x^2} \Rightarrow$

$\Rightarrow y' = \boxed{\frac{x\operatorname{ctg}x - \ln(\sin x)}{x^2}\sqrt[x]{\sin x}}$

(20) $y = x^{\sec x}$

$\ln y = \sec x\cdot\ln x = \frac{\ln x}{\cos x}$

$\frac{y'}{y} = \frac{\frac{1}{x}\cos x + \ln x\sin x}{\cos^2 x} \Rightarrow y' = \boxed{\frac{\frac{\cos x}{x} + \ln x\cdot\sin x}{\cos^2 x}\cdot x^{\sec x}}$

(21) $y = (\arcsin x)^{\sin x}$

$\ln y = \sin x\cdot\ln(\arcsin x)$

$\frac{y'}{y} = \cos x\ln(\arcsin x) + \sin x\,\frac{1}{\arcsin x}\cdot\frac{1}{\sqrt{1-x^2}} \Rightarrow$

$\Rightarrow y' = \boxed{\left[\cos x\cdot\ln(\arcsin x) + \frac{\sin x}{\arcsin x\sqrt{1-x^2}}\right]\cdot(\arcsin x)^{\sin x}}$

(22) $y = 2^{\sin\sqrt{x}}$

$y' = 2^{\sin\sqrt{x}}\cdot\ln 2\cdot\cos\sqrt{x}\cdot\frac{1}{2\sqrt{x}} = \boxed{\frac{\ln 2\cdot\cos\sqrt{x}\cdot 2^{\sin\sqrt{x}}}{2\sqrt{x}}}$

(23) $y = \log_{10}(1+2x)$

$$y' = \frac{1}{\ln 10}\,\frac{1}{1+2x}\cdot 2 = \boxed{\frac{2}{\ln 10\,(1+2x)}}$$

(24) $y = \frac{\cos x}{2\sin^2 x} - \frac{1}{2}\ln tg\,\frac{x}{2}$

$$y' = \frac{-\sin x\cdot\sin^2 x - \cos x\cdot 2\sin x\cos x}{2\sin^4 x} - \frac{1}{2}\,\frac{1}{tg\frac{x}{2}}\cdot\sec^2\frac{x}{2}\cdot\frac{1}{2} =$$

$$= \frac{-\sin x\,[\sin^2 x + 2\cos^2 x]}{2\sin^4 x} - \frac{1}{4}\,\frac{1}{\sin\frac{x}{2}\cos\frac{x}{2}} =$$

$$= \frac{-(\sin^2 x + 2\cos^2 x)}{2\sin^3 x} - \frac{1}{2\sin x} = \frac{-1}{2\sin^3 x}\left[\sin^2 x + 2\cos^2 x + \sin^2 x\right] =$$

$$= \frac{-1}{2\sin^3 x}\,(2\sin^2 x + 2\cos^2 x) = \frac{-2}{2\sin^3 x} = \boxed{\frac{-1}{\sin^3 x}}$$

(25)

$$y = \ln\frac{\sqrt{1+x^4}+x\sqrt{2}}{1-x^2} - \arcsin\frac{x\sqrt{2}}{1+x^2} =$$

$$= \ln\left[\sqrt{1+x^4}+x\sqrt{2}\right] - \ln(1-x^2) - \arcsin\frac{x\sqrt{2}}{1+x^2}$$

$$y' = \frac{\frac{4x^3}{2\sqrt{1+x^4}}+\sqrt{2}}{\sqrt{1+x^4}+x\sqrt{2}} - \frac{-2x}{1-x^2} - \frac{1}{\sqrt{1-\left(\frac{x\sqrt{2}}{1+x^2}\right)^2}}\cdot\frac{\sqrt{2}(1+x^2)-\sqrt{2}x\cdot 2x}{(1+x^2)^2} =$$

$$= \frac{\left(\frac{2x^3}{\sqrt{1+x^4}}+\sqrt{2}\right)\left(\sqrt{1+x^4}-x\sqrt{2}\right)}{\left(\sqrt{1+x^4}+x\sqrt{2}\right)\left(\sqrt{1+x^4}-x\sqrt{2}\right)} + \frac{2x}{1-x^2} - \frac{\sqrt{2}(1+x^2-2x^2)}{\sqrt{(1+x^2)^2-(x\sqrt{2})^2}\cdot(1+x^2)^2}$$

$$= \frac{2x^3 - \frac{2\sqrt{2}x^4}{\sqrt{1+x^4}} + \sqrt{2}\sqrt{1+x^4} - 2x}{1+x^4-2x^2} + \frac{2x}{1-x^2} - \frac{\sqrt{2}\,(1-x^2)}{\sqrt{1+x^4}\,(1+x^2)} = \frac{2x^3 - \frac{2\sqrt{2}x^4}{\sqrt{1+x^4}} + \sqrt{2}\sqrt{1+x^4} - 2x}{(1-x^2)^2} +$$

$$+ \frac{2x}{1-x^2} - \frac{\sqrt{2}\,(1-x^2)}{\sqrt{1+x^4}\,(1+x^2)} = \frac{\cancel{2x^3} - \frac{2\sqrt{2}x^4}{\sqrt{1+x^4}} + \sqrt{2}\sqrt{1+x^4} \cancel{-2x} \cancel{+2x} \cancel{-2x^3}}{(1-x^2)^2} - \frac{\sqrt{2}\,(1-x^2)}{\sqrt{1+x^4}\,(1+x^2)} =$$

$$= \frac{\left(\sqrt{2}\sqrt{1+x^4} - \frac{2\sqrt{2}x^4}{\sqrt{1+x^4}}\right)\sqrt{1+x^4}\,(1+x^2) - \sqrt{2}\,(1-x^2)\,(1-x^2)^2}{\sqrt{1+x^4}\,(1-x^2)^2(1+x^2)} = \frac{\sqrt{2}(1+x^4)(1+x^2) - 2\sqrt{2}\,(1+x^2)x^4 - \sqrt{2}\,(1-x^2)^3}{\sqrt{1+x^4}\,(1-x^2)(1-x^4)} =$$

$$= \frac{\sqrt{2}\left[1+x^2+x^4+\cancel{x^6}-2x^4-\cancel{2x^6}-1+3x^2-3x^4+\cancel{x^6}\right]}{\sqrt{1+x^4}\,(1-x^2)(1-x^4)} = \frac{\sqrt{2}\,(-2x^4+2x^2)}{\sqrt{1+x^4}\,(1-x^2)(1-x^4)} = \frac{2\sqrt{2}x^2(\cancel{1-x^2})}{\sqrt{1+x^4}\,(\cancel{1-x^2})(1-x^4)} =$$

$$= \boxed{\frac{2\sqrt{2}\,x^2}{\sqrt{1+x^4}\,(1-x^4)}}$$

(26) $y = \frac{x}{a+\sqrt{a^2-x^2}}$

$$y' = \frac{a+\sqrt{a^2-x^2} - x\,\frac{-2x}{2\sqrt{a^2-x^2}}}{\left(a+\sqrt{a^2-x^2}\right)^2} = \frac{a\sqrt{a^2-x^2}+a^2-x^2+x^2}{\left(a+\sqrt{a^2-x^2}\right)^2\sqrt{a^2-x^2}}$$

$$= \frac{a^2+a\sqrt{a^2-x^2}}{\left(a+\sqrt{a^2-x^2}\right)^2\sqrt{a^2-x^2}} = \frac{a\left(a+\sqrt{a^2-x^2}\right)}{\left(a+\sqrt{a^2-x^2}\right)^2\sqrt{a^2-x^2}} = \boxed{\frac{a}{\left(a+\sqrt{a^2-x^2}\right)\sqrt{a^2-x^2}}}$$

(27) $y = \frac{(3-x)(2x-1)}{1+x^2}$

$\ln y = \ln(3-x) + \ln(2x-1) - \ln(1+x^2)$

$$\frac{y'}{y} = \frac{-1}{3-x} + \frac{2}{2x-1} - \frac{2x}{1+x^2} =$$

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

$$= \frac{-2x - \cancel{2x^3} + 1 + x^2 + 6 + 6x^2 - 2x - \cancel{2x^3} - 12x^2 + 6x + \cancel{4x^3} - 2x^2}{(3-x)(2x-1)(1+x^2)} = \frac{-7x^2+2x+7}{(3-x)(2x-1)(1+x^2)}$$

$$y' = \frac{-7x^2+2x+7}{(3-x)(2x-1)(1+x^2)} \cdot \frac{(3-x)(2x-1)}{1+x^2} = \boxed{\frac{-7x^2+2x+7}{(1+x^2)^2}}$$

$$y'' = \frac{(-14x+2)(1+x^2)^2 - (-7x^2+2x+7)\cdot 2(1+x^2)\cdot 2x}{(1+x^2)^4} = \frac{(1+x^2)\left[(-14x+2)(1+x^2) - 4x(-7x^2+2x+7)\right]}{(1+x^2)^4}$$

$$= \frac{-14x - 14x^3 + 2 + 2x^2 + 28x^3 - 8x^2 - 28x}{(1+x^2)^3} = \boxed{\frac{14x^3 - 6x^2 - 42x + 2}{(1+x^2)^3}}$$

28 $\quad y = \frac{7x-1}{(2x+3)^4}$

$$y' = \frac{7(2x+3)^4 - (7x-1)\cdot 4(2x+3)^3\cdot 2}{(2x+3)^8} = \frac{(2x+3)^3\left[7(2x+3) - 8(7x-1)\right]}{(2x+3)^8} =$$

$$= \frac{14x+21-56x+8}{(2x+3)^5} = \boxed{\frac{29-42x}{(2x+3)^5}}$$

$$y'' = \frac{-42(2x+3)^5 - (29-42x)\cdot 5(2x+3)^4\cdot 2}{(2x+3)^{10}} =$$

$$= \frac{(2x+3)^4\left[-42(2x+3) - 10(29-42x)\right]}{(2x+3)^{10}} =$$

$$= \frac{-84x-126-290+420x}{(2x+3)^6} = \boxed{\frac{336x-416}{(2x+3)^6}}$$

a)

$f(x) = (\arcsin x)^{\sqrt{x}}$

$\ln y = \sqrt{x} \ln \arcsin x$

$\frac{y'}{y} = \sqrt{x} \frac{1}{\arcsin x} \cdot \frac{1}{\sqrt{1-x^2}} + \frac{1}{2\sqrt{x}} \ln \arcsin x$; $\boxed{y' = \left(\frac{1}{2\sqrt{x}} \ln \arcsin x + \frac{\sqrt{x}}{\arcsin x \sqrt{1-x^2}}\right)(\arcsin x)^{\sqrt{x}}}$

b)

$y = \frac{\operatorname{tg} x}{x \sin x} = \frac{\sin x / \cos x}{x \sin x} = \frac{1}{x \cos x}$

$y' = \frac{-(1 \cdot \cos x - x \sin x)}{x^2 \cos^2 x} = \boxed{\frac{x \sin x - \cos x}{x^2 \cos^2 x}}$

c)

$y = \sin(\operatorname{tg}\sqrt{x})$

$y' = \cos(\operatorname{tg}\sqrt{x}) \cdot \sec^2\sqrt{x} \cdot \frac{1}{2\sqrt{x}} = \boxed{\frac{\cos(\operatorname{tg}\sqrt{x}) \cdot \sec^2\sqrt{x}}{2\sqrt{x}}}$

d)

$y = \sqrt{\frac{x+1}{x-1}}$

$y' = \frac{1}{2\sqrt{\frac{x+1}{x-1}}} \cdot \frac{(x-1)-(x+1)}{(x-1)^2} = \frac{-\cancel{2}}{\cancel{2}(x-1)^2\sqrt{\frac{x+1}{x-1}}} = \frac{-1}{(x-1)\sqrt{\frac{x+1}{\cancel{x-1}}(x-1)^{\cancel{2}}}} = \frac{-1}{(x-1)\sqrt{(x+1)(x-1)}} = \boxed{\frac{-1}{(x-1)\sqrt{x^2-1}}}$

e)

$y = \cos^3(x^2+4)$

$y' = 3\cos^2(x^2+4) \cdot [-\sin(x^2+4)] \cdot 2x = \boxed{-6x \cos^2(x^2+4)\sin(x^2+4)}$

f)

$y = 3^{x^2} + 5$

$y' = 3^{x^2} \cdot \ln 3 \cdot 2x = \boxed{2(\ln 3)\, x\, 3^{x^2}}$

g)

$y = \sec x = \frac{1}{\cos x}$

$y' = \frac{-(-\sin x)}{\cos^2 x} = \boxed{\frac{\sin x}{\cos^2 x}} = \boxed{\sec x \cdot \operatorname{tg} x}$

h)

$y = \ln(\operatorname{tg}(x+e^x))$

$y' = \frac{1}{\operatorname{tg}(x+e^x)} \cdot \sec^2(x+e^x) \cdot (1+e^x) = \boxed{\frac{1+e^x}{\sin(x+e^x)\cos(x+e^x)}}$

i)

$y = \operatorname{tg}(\operatorname{tg} x) + \operatorname{tg}^2 x$

$y' = \sec^2(\operatorname{tg} x) \cdot \sec^2 x + 2\operatorname{tg} x \sec^2 x = \boxed{[\sec^2(\operatorname{tg} x) + 2\operatorname{tg} x]\sec^2 x}$

j)

$$y = \sqrt{\sin(x^2)}$$

$$y' = \frac{1}{2\sqrt{\sin(x^2)}} \cdot \cos(x^2) \cdot 2x = \boxed{\frac{x\cos(x^2)}{\sqrt{\sin(x^2)}}}$$

k)

$$y = \operatorname{arctg}\sqrt{x^2-1}$$

$$y' = \frac{1}{1+\left(\sqrt{x^2-1}\right)^2} \cdot \frac{1}{2\sqrt{x^2-1}} \cdot 2x = \frac{1}{1+x^2-1} \cdot \frac{x}{\sqrt{x^2-1}} = \frac{x}{x^2\sqrt{x^2-1}} = \boxed{\frac{1}{x\sqrt{x^2-1}}}$$

l)

$$y = \ln(\arccos(-x))$$

$$y' = \frac{1}{\arccos(-x)} \cdot \frac{-1}{\sqrt{1-(-x)^2}} \cdot (-1) = \boxed{\frac{1}{\arccos(-x)\sqrt{1-x^2}}}$$

m)

$$y = \frac{\log_{10} x}{x}$$

$$y' = \frac{\frac{1}{x}\cdot\frac{1}{\ln 10}\cdot x - \log_{10} x}{x^2} = \frac{\frac{1}{\ln 10} - \log_{10} x}{x^2} = \boxed{\frac{1 - \ln 10 \cdot \log_{10} x}{x^2 \ln 10}}$$

n)

$$y = \operatorname{tg}\left(e^{2x-1}\right)$$

$$y' = \sec^2\left(e^{2x-1}\right) \cdot e^{2x-1} \cdot 2 = \boxed{2\sec^2\left(e^{2x-1}\right) \cdot e^{2x-1}}$$

ñ)

$$y = \frac{1}{x} + \sec^3(-3x^2+4)$$

$$y' = \frac{-1}{x^2} + 3\sec^2(-3x^2+4) \cdot \sec(-3x^2+4) \cdot \operatorname{Tg}(-3x^2+4) \cdot (-6x) =$$

$$= \boxed{-\frac{1}{x^2} - 18x\sec^3(-3x^2+4)\operatorname{tg}(-3x^2+4)}$$

o)

$$y = x + \cos^2 x^3$$

$$y' = 1 + 2\cos x^3 \cdot (-\sin x^3) \cdot 3x^2 = \boxed{1 - 6\cos x^3 \cdot \sin x^3}$$

p)

$$y = (2x+1)^2 \cdot \sqrt{3x-2}$$

$$y' = 2(2x+1)\sqrt{3x-2} + (2x+1)^2 \frac{1}{2\sqrt{3x-2}} \cdot \sqrt{3} = 2(2x+1)\sqrt{3x-2} + \frac{\sqrt{3}\,(2x+1)^2}{2\sqrt{3x-2}} =$$

$$= \frac{4(2x+1)(3x-2) + \sqrt{3}\,(2x+1)^2}{2\sqrt{3x-2}} = \frac{(2x+1)\left[4(3x-2) + \sqrt{3}\,(2x+1)\right]}{2\sqrt{3x-2}} =$$

$$= \boxed{\frac{(2x+1)\left((12+2\sqrt{3})x + (\sqrt{3}-8)\right)}{2\sqrt{3x-2}}}$$

q]

$$y = \frac{x}{\sqrt[3]{(3-x)^2}}$$

$$y' = \frac{1\cdot\sqrt[3]{(3-x)^2} - x\,\frac{1}{3\sqrt[3]{(3-x)^4}}\cdot 2(3-x)\cdot(-1)}{\left(\sqrt[3]{(3-x)^2}\right)^2} = \frac{\sqrt[3]{(3-x)^2} + \frac{2x(3-x)}{\sqrt[3]{(3-x)^4}}}{\sqrt[3]{(3-x)^4}} =$$

$$= \frac{\frac{\sqrt[3]{(3-x)^6} + 2x(3-x)}{\sqrt[3]{(3-x)^4}}}{\sqrt[3]{(3-x)^4}} = \frac{(3-x)^2 + 2x(3-x)}{\sqrt[3]{(3-x)^8}} = \frac{9-6x+x^2+6x-2x^2}{\sqrt[3]{(3-x)^8}} = \boxed{\frac{9-x^2}{\sqrt[3]{(3-x)^8}}}$$

r]

$$y = \frac{2x-1}{\sqrt[3]{3x^2}}$$

$$y' = \frac{2\sqrt[3]{3x^2} - (2x-1)\,\frac{1}{3\sqrt[3]{(3x^2)^2}}\cdot 6x}{\left(\sqrt[3]{3x^2}\right)^2} = \frac{2\sqrt[3]{3x^2} - \frac{2x(2x-1)}{\sqrt[3]{(3x^2)^2}}}{\sqrt[3]{(3x^2)^2}} = \frac{\frac{2\cdot 3x^2 - 2x(2x-1)}{\sqrt[3]{(3x^2)^2}}}{\sqrt[3]{(3x^2)^2}} =$$

$$= \frac{4x^2+2x}{\sqrt[3]{(3x^2)^4}} = \frac{2x(2x+1)}{3x^2\sqrt[3]{3x^2}} = \boxed{\frac{2(2x+1)}{3x\sqrt[3]{3x^2}}}$$

s]

$$y = \sqrt{\frac{2x-1}{x^3-1}}$$

$$y' = \frac{1}{2\sqrt{\frac{2x-1}{x^3-1}}}\cdot\frac{2(x^3-1) - (2x-1)\cdot 3x^2}{(x^3-1)^2} = \frac{2x^3-2-6x^3+3x^2}{2(x^3-1)^2\sqrt{\frac{2x-1}{x^3-1}}} = \boxed{\frac{-4x^3+3x^2-2}{2(x^3-1)^2\sqrt{\frac{2x-1}{x^3-1}}}} =$$

$$= \frac{(-4x^3+3x^2-2)}{2(x^3-1)^{\cancel{2}}\,\frac{2x-1}{\cancel{x^3-1}}}\cdot\sqrt{\frac{2x-1}{x^3-1}} = \boxed{\frac{-4x^3+3x^2-2}{2(x^3-1)(2x-1)}\cdot\sqrt{\frac{2x-1}{x^3-1}}}$$

t]

$$y = (x-\sin x)^{\sqrt{x}}$$

$$\ln y = \sqrt{x}\cdot\ln(x-\sin x)$$

$$\frac{y'}{y} = \frac{1}{2\sqrt{x}}\ln(x-\sin x) + \sqrt{x}\cdot\frac{1}{x-\sin x}\cdot(1-\cos x) = \frac{\ln(x-\sin x)}{2\sqrt{x}} + \frac{\sqrt{x}(1-\cos x)}{x-\sin x}$$

$$\boxed{y' = \left[\frac{\ln(x-\sin x)}{2\sqrt{x}} + \frac{\sqrt{x}(1-\cos x)}{x-\sin x}\right](x-\sin x)^{\sqrt{x}}}$$

u)

$$y = \frac{\operatorname{arctg}\sqrt{x}}{\sqrt{x}}$$

$$y' = \frac{\frac{1}{1+(\sqrt{x})^2}\cdot\sqrt{x} - \operatorname{arctg}\sqrt{x}\cdot\frac{1}{2\sqrt{x}}}{(\sqrt{x})^2} = \frac{\frac{\sqrt{x}}{1+x} - \frac{\operatorname{arctg}\sqrt{x}}{2\sqrt{x}}}{x} =$$

$$= \boxed{\frac{2x - (1+x)\operatorname{arctg}\sqrt{x}}{2x(1+x)\sqrt{x}}}$$

v)

$$y = \ln 5 + 5^x + x^5 + x^x + 5^5$$

$$y' = 0 + 5^x\cdot\ln 5 + 5x^4 + x\cdot x^{x-1} + x^x\cdot\ln x + 0 = \boxed{5^x\ln 5 + 5x^4 + x^x(1+\ln x)}$$

Nota: La derivada de x^x se puede hacer directamente derivándola cual si fuese potencial $(x\cdot x^{x-1})$ y sumándole cual si fuese exponencial $(x^x\ln x)$

También se podría hacer logarítmicamente:

$$y = x^x \;;\quad \ln y = x\cdot\ln x \;;\quad \frac{y'}{y} = 1\cdot\ln x + x\cdot\frac{1}{x} = \ln x + 1 \;;\quad y' = (\ln x + 1)\cdot x^x$$

w)

$$y = \ln\sqrt{\frac{x^3\cos x}{\sin x}} = \frac{1}{2}\left(3\ln x + \ln\cos x - \ln\sin x\right)$$

$$y' = \frac{1}{2}\left(\frac{3}{x} - \frac{\sin x}{\cos x} - \frac{\cos x}{\sin x}\right) = \frac{1}{2}\left(\frac{3}{x} - \frac{\sin^2 x + \cos^2 x}{\cos x\sin x}\right) = \boxed{\frac{1}{2}\left(\frac{3}{x} - \frac{1}{\sin x\cos x}\right)} = \boxed{\frac{3}{2x} - \frac{1}{\sin(2x)}}$$