Erick Saur

1)

a) $(x^2+1)^7$

$7(x^2+1)^6(x^2+1)$

$7(x^2+1)^6 \cdot 2x$

$14x(x^2+1)^6$

b) $\frac{1}{2\sqrt{x^2}}(x^2+1)$

$\frac{1}{2\sqrt{x^2}} \cdot 2x = \frac{x}{\sqrt{x^2+1}}$

c) $\sqrt{5x+2}$

$\frac{1}{2\sqrt{5x+2}} = 5x+2 = 5$

d) $\sqrt[3]{\sqrt{2^2} \cdot x}$

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

e) $(2x+1)^3$

$2(2x+1)2x+1$

$2(2x+1) \cdot 2$

$4(2x+1)$

f) $\sqrt{7x+3}$

$\frac{1}{2\sqrt{7x+3}} \cdot 7x(+3) = \frac{7}{2\sqrt{7x+3}}$

g) $\left(\frac{x}{1-3x}\right)^5$

$5\left(\frac{x}{1-3x}\right)^4 \cdot \frac{-1}{1-3x^2} = \frac{5x^4}{(1-3x)^6}$

H) $(2x-7)^3$

$3(2x-7)^2 \cdot 2x-7$

$6(2x-7)^2$

i) $(25+x^2)^{-\frac{1}{2}}$

$g = 25+x^2$

$g^{-\frac{1}{2}} \cdot (25+x^2)$

$g \cdot -\frac{1}{2}(25 \cdot x^2)^{-\frac{3}{2}} \cdot 2x$

$f'(x) = -\frac{x}{(25+x^2)\sqrt{25+x^2}}$

j) $3(9x-4)^4$

$g = 9x - 4$

$3 \cdot g^4 \cdot (9x-4)$

$3 \cdot 4(9x-4)^3 \cdot 9 = 108(9x-4)^3$

2)

a) $12^x = a^x \ln(a)$

$12^x \ln(12)$

B) $\left(\frac{2}{5}\right)^x = \left(\frac{2}{5}\right)^x \ln\left(\frac{2}{5}\right)$

c) $-4e^x$

D) $(a.1)' = a.1'$

$7.10^x = 7.10^x \ln(10)$

e) $e^{(3x^2-4)}$

$3x^2-4 \cdot (3x^2-4)$

$3x^2-4 \cdot 6x$

$e^{3x^2-4} \cdot 6x$

f) $2^{(5x-3x^2)}$

$2^{5x-3x^2} = \cancel{e^{(5x-3x^2)} \ln(2)} \cdot \ln(2)(5-6x)$

$\ln 2 \cdot 2^{5x-3x^2}(5-6x)$

g) $\frac{1}{3}^{\sqrt{6x}} = \frac{1}{3}(1^{\sqrt{6x}}) = e^{\sqrt{6x}} = 0$

H) $e^{\frac{x+1}{x-1}} = e^{\frac{x+1}{x-1}} \cdot \frac{x+1}{x-1} = \frac{2}{(x-1)^2}$

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

i) $6e^{\sqrt{x}} = 6e^{\sqrt{x}} \ln 6$

3)

a) $\log_2 3x = \log_2(g) \cdot 3x = \frac{1}{\ln(2)g} \cdot 3$

$\frac{1}{\ln(2)x}$

b) $\ln(x^2+1)$

$\ln(g) \cdot (x^2+1)$

$\frac{1}{g} \cdot 2x = \frac{1}{x^2+1} \cdot 2x = \frac{2x}{x^2+1}$

c) $\log_6(x) = \frac{1}{\ln(6)x}$

D) $\log_4 5x = \log_4(g) \cdot 5x = \frac{1}{\ln(4)g} \cdot 5 =$

$\frac{1}{\ln(4)x}$