Find $\frac{d}{dx}(f(g(x))$ at $x=2$

if $g(2)=5$ $g'(2)=3$ $f'(5)=10$

$X=-2, x=1$

$$f(x) = \frac{\cot x}{2x - 3}$$

$$f'(x) = 6\tan(3x)\sec^2(3x)$$

Find the equation of the tangent line

$y = 3x^2 - 3 \qquad x = -2$

$y = 9 + 12(x-1)$

$$f(x) = \cot(2x - e)$$

$$f'(x) = 2x \arctan x + 1$$

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

$$f'(x) = 20x^4 + \frac{6}{x^4}$$

$$y = \arcsin(x^3)$$

$$f'(x) = -2\csc^2(2x-e)$$

$$y = e^x \ln x$$

$$f'(x) = -\frac{1}{2}\left(10^{5-x}\right)^{-1/2} \cdot 10^{5-x} \cdot \ln 10$$

$$y = \ln\left(3xe^{1-x}\right)$$

$$f'(x) = \frac{e^x}{x} + \ln x e^x$$

Find the horizontal tangents

$\cancel{y = 3x^2 - x^3}$ $y = 2x^3 + 3x^2 - 12x + 1$

$y = 20 - 24(x+2)$

$$f(x) = e^{\cos 2x}$$

$$f'(x) = 672x^3(3x^4-5)^{55}$$

$$f(x) = 4x^5 - \frac{2}{x^3} - 2\pi$$

$$f'(x) = 3e^{3x}\cos 2x - 2e^{3x}\sin 2x$$

$$y = x^2 \log_4\left(\frac{e^x}{4^x}\right)$$

$$y' = \frac{x\sec^2 x + \tan x}{x \tan x \ln 7}$$

$$f(x) = (3x^4 - 5)^{56}$$

$$f'(x) = \frac{3\sin^2\sqrt{x}\cos\sqrt{x}}{2\sqrt{x}}$$

$$f(x) = \sqrt{x}\,(x^3 - x^{-1})$$

$$f'(x) = \frac{3\csc^2 x - 2x\csc^2 x - 2\cot x}{(2x-3)^2}$$

$$f(x) = \tan^2(3x)$$

$$f'(x) = 1 + \frac{3}{x^{5/2}}$$

$$f(x) = \sin^3(\sqrt{x})$$

$$f'(x) = \frac{3x^2}{\sqrt{1-x^6}}$$

Find the equation of the tangent line

$y = (1+2x)^2$ at $x = 1$

$f'(x) = \frac{x^2 - \ln 4}{\ln 4} + \log_4\left(\frac{e^x}{4^x}\right) \cdot 2x$

$f'(x) = \frac{x^2}{\ln 4} - 1 + 2x \log_4\left(\frac{e^x}{4^x}\right)$

$$y = \log_7 (x \tan x)$$

$$f'(x) = \frac{1}{3xe^{1-x}} \left(-3xe^{1-x} + 3e^{1-x} \right)$$

$$f(x) = (x^2+1) \arctan x$$

$$f'(x) = \frac{7}{2} x^{5/2} + \frac{1}{2x^{3/2}}$$

$$f(x) = e^{3x}\cos(2x)$$

$$y = \sqrt{10^{5-x}}$$

$$f'(x) = x^2 2^x \ln 2 + 2^x \cdot 2x$$

$$f(x) = x^2 2^x$$

$$f'(x) = -2\sin 2x \, e^{\cos 2x}$$