

$$[x^n]' =$$

$$[cf(x)]' =$$

$$[f(x) \pm g(x)]' =$$

$$[f(x)g(x)]' =$$

$$\left[\frac{f(x)}{g(x)}\right]' =$$

$$[f(g(x))]' =$$

$$[\sin x]' =$$

$$[\cos x]' =$$

$$[\tan x]' =$$

$$[\cot x]' =$$

$$[\sec x]' =$$

$$[\csc x]' =$$

$$[e^x]' =$$

$$[a^x]' =$$

$$[\ln x]' =$$

$$[\log_a x]' =$$

$$[\arcsin x]' =$$

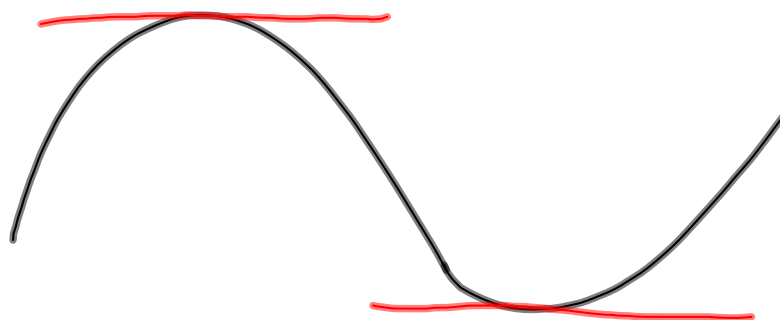
$$[\arctan x]' =$$

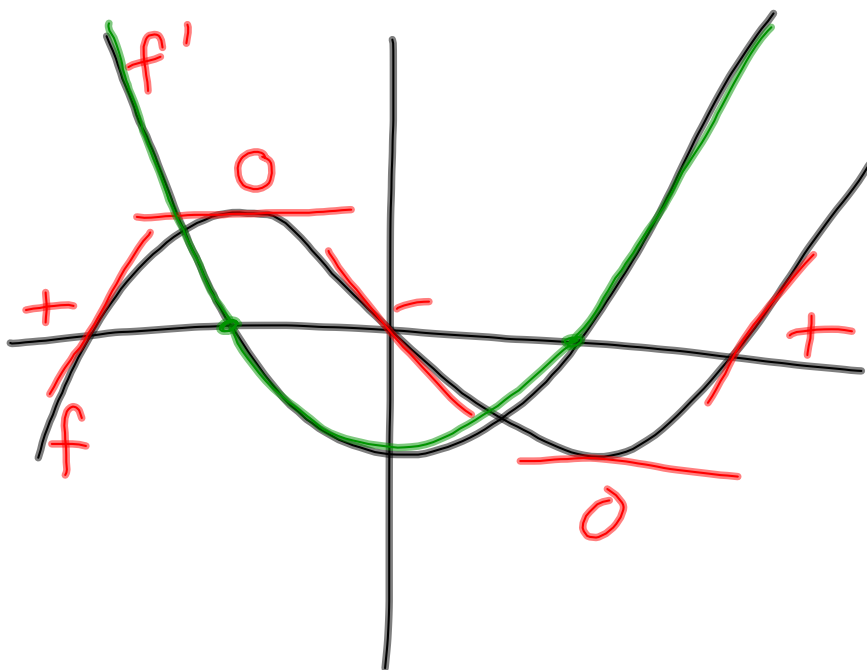
$$[\operatorname{arcsec} x]' =$$

$$[\arccos x]' =$$

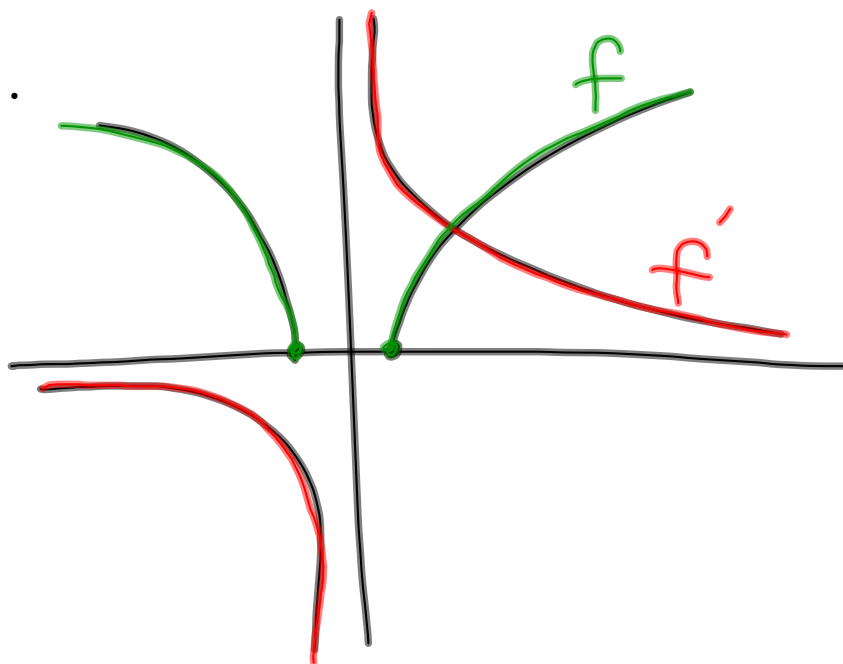
$$[\operatorname{arccot} x]' =$$

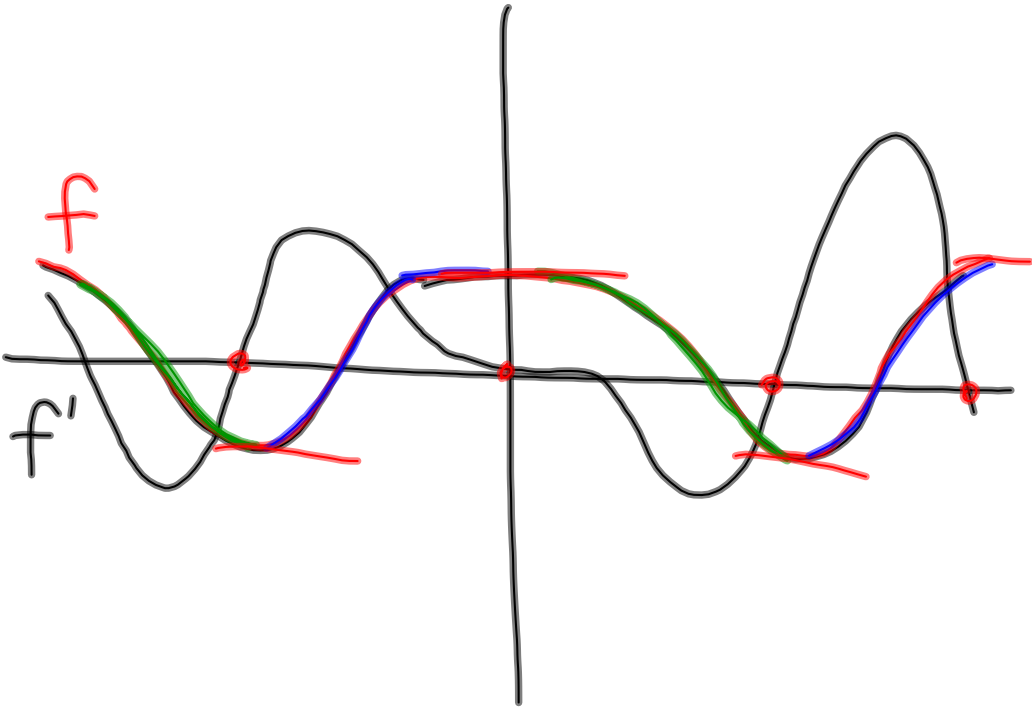
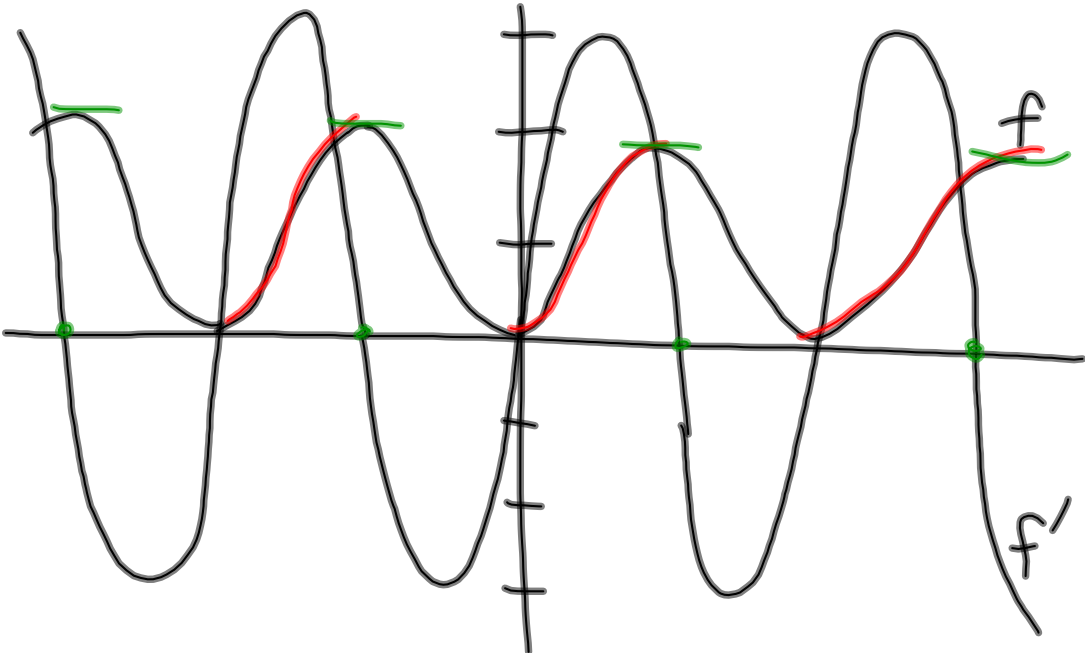
$$[\operatorname{arccsc} x]' =$$





84.





The Chain Rule, cont.

2.4

$$18. f(x) = -3\sqrt[4]{2 - 9x}$$

$$32. h(t) = \left( \frac{t^2}{t^3 + 2} \right)^2$$

$$50. h(x) = \sec x^2$$

$$60. g(t) = 5 \cos^2 \pi t$$

$$66. y = \sin \sqrt[3]{x} + \sqrt[3]{\sin x}$$

5.4

$$46. g(t) = e^{-3/t^2}$$

$$48. y = \ln \left( \frac{1 + e^x}{1 - e^x} \right)$$

$$58. y = \ln e^x$$

5.5

$$46. f(t) = \frac{3^{2t}}{t}$$

$$54. y = \log_{10} \frac{x^2 - 1}{x}$$

5.8

$$44. f(x) = \operatorname{arcsec} 2x$$

$$48. h(x) = x^2 \arctan x$$

$$52. y = \ln(t^2 + 4) - \frac{1}{2} \arctan \frac{t}{2}$$

$$56. y = x \arctan 2x - \frac{1}{4} \ln(1 + 4x^2)$$

5.4 – Find the second derivative

$$80. f(x) = \frac{1}{x - 2}$$

$$82. f(x) = \sec^2 \pi x = [\sec \pi x]^2$$

$$f'(x) = 2 \sec \pi x \cdot \sec \pi x \tan \pi x \cdot \pi$$

$$= (2\pi)(\sec^2 \pi x)(\tan \pi x)$$

$$f''(x) = 2\pi \left[ \sec^2 \pi x \cdot \sec^2 \pi x \cdot \pi + \tan \pi x \cdot (2\pi \sec^2 \pi x \tan \pi x) \right]$$

$$= 2\pi^2 \sec^4 \pi x + 4\pi^2 \sec^2 \pi x \tan^2 \pi x$$

5.4 Find the equation of the tangent line to the graph of  $f$  at the indicated point.

$$78. f(x) = \tan^2 x ; \left(\frac{\pi}{4}, 1\right)$$

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



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

$$m = f' \left( \frac{\pi}{4} \right) = 2 \tan \left( \frac{\pi}{4} \right) \cdot \left( \sec \frac{\pi}{4} \right)^2$$

$$= 2(1) \cdot (\sqrt{2})^2$$

$$= 4$$

$$y - y_1 = m(x - x_1)$$

$$y - 1 = 4 \left( x - \frac{\pi}{4} \right)$$

$$\boxed{y = 4x - \pi + 1}$$



Relang the graph of a funcon to the graph of its derivave

(2.2#71-72; 2.3#99-100; 2.4#83-86)