$$(c \cdot f(x))' = \lim_{h \to 0} \frac{c \cdot f(x+h) - c \cdot f(x)}{h} =$$

$$= c \cdot \lim_{h \to 0} \frac{f(x+h) - f(x)}{h} = c \cdot f'(x)$$

$$(f \cdot g \cdot h)' = [\underline{(f \cdot g)} \cdot \underline{h}]'$$

$$= f' \cdot g \cdot h + f g' h + f g h'$$

$$\lim_{x \to x_0} f(x) = f(x_0)$$

$$x' = \lim_{x \to x_0} \frac{x - x_0}{x - x_0} = \lim_{x \to x_0} 1 = 1$$

$$(f \circ g \circ h)'_{(x)} = f'(g \circ h) \cdot g'(h) \cdot h'$$

$$\lim_{h \to 0} \frac{5-5}{h} = \lim_{h \to 0} \left(\frac{0}{h} \right) = \lim_{h \to 0} 0$$

$$f(x) = 5, \quad f(x+h) = 5$$

$$a^{x} = e^{\ln a^{x}} = e^{x \cdot \ln a}$$

$$(a^{x})' = e^{x \cdot \ln a} \cdot (x \cdot \ln a)' = e^{x \cdot \ln a} \cdot \ln a (x)'$$

$$\left(\sin\frac{h}{2}\right)^2 = \frac{1-\cos\cancel{h}}{2} \quad \Big| \cdot (-2)$$

$$-2\cdot\left(\sin\frac{h}{2}\right)^2 = \cos h - 1$$

$$\lim_{x \to 0} \frac{\sin x}{x} = 1$$

$$\lim_{\frac{h}{2} \to 0} \frac{\sin \frac{h}{2}}{\frac{h}{2}} = 1$$

$$x \to \frac{h}{2}$$

$$\underbrace{\lim_{h \to 0} \frac{\sin \frac{h}{2}}{\frac{h}{2}}}_{1} \cdot \underbrace{\frac{1}{2}}_{\frac{1}{2}}$$

$$(\operatorname{ctg} x)' = \left(\frac{\cos x}{\sin x}\right)' =$$

$$= \frac{-\sin x \cdot \sin x - \cos x \cdot \cos x}{\sin^2 x} = \frac{-(\sin^2 x + \cos^2 x)}{\sin^2 x}$$

$$\cos\xi = \sqrt{1-\sin^2\xi}$$

$$\overline{\left[\sin(\arcsin x)\right]^2}$$

$$\cfrac{1}{\cfrac{1}{\cfrac{1}{1+\beta^2 x}}}$$

$$(f \cdot g \cdot h \cdot \ell)' = \ldots$$

$$\frac{\frac{f}{g}}{\frac{h}{\ell}} = \frac{f \cdot \ell}{g \cdot h}$$

$$\left(\ln f(x)\right)' = \frac{1}{f(x)} \cdot f'(x)$$

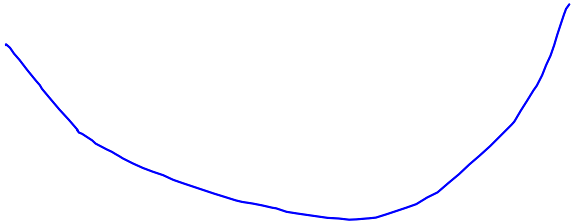
$$(\ln f)' = \frac{f'}{f} \Rightarrow f' = \boxed{f \cdot (\ln f)'}$$

$$f(x) = \frac{(2x+3)^4 \cdot e^x \cdot (3x+1)^2}{(4-2x)^5}$$

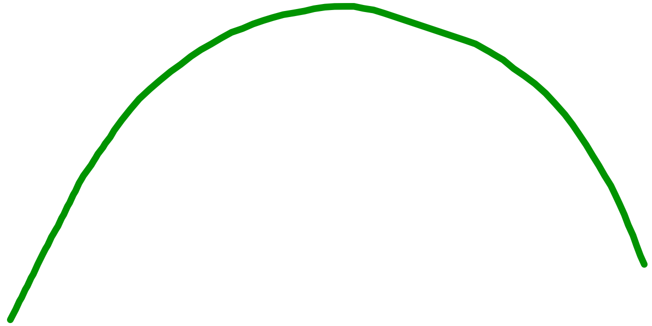
$$\ln f(x) = 4 \cdot \ln(2x+3) + x \cdot \ln e + 2 \cdot \ln(3x+1) - 5 \cdot \ln(4-2x)$$

$$\frac{e^{\ln f^g} = e^{g \cdot \ln f} = (e^{\ln f})^g}{e^{\ln(f^g)}}$$

$f'' > 0$ $f' \nearrow$



$f'' < 0$, $f' \searrow$



$$f(x) = 3x^5 - 4 \quad , \quad f'''(1) = ?$$

$$f'(x) = 15x^4$$

$$f''(x) = 60x^3$$

$$f'''(x) = 180x^2 \Rightarrow f'''(1) = 180$$