

Παράγωγοι Συναρτήσεων

$$(c)' = 0$$

$$(x)' = 1$$

$$(x^2)' = 2x$$

$$(x^\alpha)' = \alpha x^{\alpha-1}$$

$$(\sqrt{x})' = \frac{1}{2\sqrt{x}}$$

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

$$(e^x)' = e^x$$

$$(\ln x)' = \frac{1}{x}$$

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

$$(\eta \mu x)' = \sigma \nu \nu x$$

$$(\sigma \nu \nu x)' = -\eta \mu x$$

$$(\epsilon \varphi x)' = \frac{1}{\sigma \nu \nu^2 x}$$

$$(\sigma \varphi x)' = -\frac{1}{\eta \mu^2 x}$$

$$(cf(x))' = cf'(x)$$

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

$$(f(x) \cdot g(x))' = f'(x) \cdot g(x) + f(x) \cdot g'(x)$$

$$\left(\frac{f(x)}{g(x)}\right)' = \frac{f'(x) \cdot g(x) - f(x) \cdot g'(x)}{g^2(x)}$$

$$(f(g(x)))' = f'(g(x)) \cdot g'(x)$$

Παράγωγοι σύνθετων συναρτήσεων

$$([f(x)]^v)' = v [f(x)]^{v-1} \cdot f'(x)$$

$$\left(\sqrt{f(x)}\right)' = \frac{1}{2\sqrt{f(x)}} f'(x) \quad f(x) > 0$$

$$(\eta\mu f(x))' = \sigma\upsilon\nu f(x) \cdot f'(x)$$

$$(\sigma\upsilon\nu f(x))' = -\eta\mu f(x) \cdot f'(x)$$

$$(\ln f(x))' = \frac{1}{f(x)} f'(x), \quad f(x) > 0$$

$$(\ln |f(x)|)' = \frac{1}{f(x)} f'(x)$$

$$(\varepsilon\phi f(x))' = \frac{1}{\sigma\upsilon\nu^2 f(x)} \cdot f'(x)$$

$$(\sigma\phi f(x))' = -\frac{1}{\eta\mu^2 f(x)} \cdot f'(x)$$

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

$$(\alpha^{f(x)})' = \alpha^{f(x)} \cdot \ln \alpha \cdot f'(x)$$

$$([f(x)]^t)' = t[f(x)]^{t-1} \cdot f'(x)$$

Να βρείτε τις παραγώγους:

$$(c)' = \quad (5)' = \quad (\ln 3)' = \quad (\sqrt{15})' = \quad (e^2)' =$$

$$(\eta\mu\pi)' = \quad (\sigma\upsilon\nu 30)' = \quad (\epsilon\varphi 60)' = \quad \left(\sigma\varphi\frac{\pi}{3}\right)' =$$

$$(x^2)' = \quad (x^5)' = \quad \left(x^{\frac{3}{2}}\right)' = \quad (x^{-9})' =$$

$$(\sqrt{x})' = \quad \left(\frac{1}{x}\right)' = \quad (e^x)' = \quad (\ln x)' = \quad (2^x)' =$$

$$(\eta\mu x)' = \quad (\sigma\upsilon\nu x)' = \quad (\epsilon\varphi x)' = \quad (\sigma\varphi x)' =$$

$$(cf(x))' = \quad (2x)' = \quad (3x^2)' = \quad (6\sqrt{x})' = \quad \left(\frac{1}{2}\ln x\right)' =$$

$$(f(x) + g(x))' =$$

$$\left(x^2 + x^6 - x^{\frac{2}{3}}\right)' =$$

$$(\eta\mu x + \eta\mu\pi)' =$$

$$(e^x - e^{\ln 2})' =$$

$$(f(x) - g(x))' =$$

$$(2x^4 + \ln x - \sqrt{5})' =$$

$$(\ln x + \ln e^3)' =$$

$$(\ln x + e^x - \sigma\upsilon\nu x)' =$$

$$(f(x) \cdot g(x))' =$$

$$(e^x \cdot x^2)' =$$

$$((x^2 + 2x)\eta\mu\chi)' =$$

$$((x^4 \cdot \eta\mu\chi \cdot \ln x)' =$$

$$(\ln x \cdot \eta\mu x)' =$$

$$(x \cdot \sqrt{x})' =$$

$$(x \ln x)' =$$

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

$$\left(\frac{\eta\mu x}{x}\right)' =$$

$$\left(\frac{x^2+3}{x}\right)' =$$

$$\left(\frac{\eta\mu x}{1+\sigma\upsilon\nu x}\right)' =$$

$$\left(\frac{\ln x}{e^x}\right)' =$$

$$\left(\frac{1}{x-2}\right)' =$$

$$\left(\frac{\ln x}{\sqrt{x}}\right)' =$$

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

$$(e^{2x})' =$$

$$(\ln(\eta\mu x))' =$$

$$(\sigma\upsilon\nu 4x)' =$$

$$(\sqrt{5x})' =$$

$$(\ln(x^2 + 1))' =$$

$$(\eta\mu^2 6x)' =$$

Να βρείτε την παράγωγο της συνάρτησης f στο σημείο x_0

i) $f(x) = x^2 \ln x$ στο $x_0 = 1$

ii) $f(x) = x^2 + 5\eta\mu x$ στο $x_0 = 0$

Να βρείτε την δεύτερη παράγωγο των συναρτήσεων:

i) $f(x) = x^5 - x^7 + 4x$

ii) $f(x) = e^x \cdot \ln x$

iii) $f(x) = \eta\mu(3x)$

Να βρείτε την παράγωγο της συνάρτησης στο σημείο $x_0 = 0$

$$f(x) = \begin{cases} \sigma\upsilon\nu x & x_0 \leq 0 \\ x^2 + 1 & x_0 > 0 \end{cases}$$