

42) DERIVACE FUNKCE, PRAVIDLA DERIVOVÁNÍ, DERIVACE SLOŽENÉ FUNKCE  
 GEOMETRICKÝ ÚTVARAM DERIVACE

1) Napište rovnici tečny ke grafu fu  $f(x) = x^2 - x + 1$   
 v bodě  $T[-2, 4]$  Určete vzájemnou polohu grafu funkce a tečny.  $5x + y + 3 = 0$   
 graf fu je nad tečnou

2) Zderivujte funkce

a)  $f(x) = \frac{1+x-x^2}{1-x+x^2}$  |  $f'(x) = \frac{2(1-2x)}{(1-x+x^2)^2}$

b)  $f(x) = \sin x \cdot \cos x$  |  $f'(x) = \cos 2x$

c)  $f(x) = x^2 \cotg x$  |  $f'(x) = \frac{x(\sin 2x - x)}{\sin^2 x}$

d)  $f(x) = \frac{\cos x}{1 - \sin x}$  |  $f'(x) = \frac{1}{1 - \sin x}$

e)  $f(x) = \frac{1+e^x}{1-e^x}$  |  $f'(x) = \frac{2e^x}{(1-e^x)^2}$

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

3) Zderivujte složené funkce a upište

a)  $f(x) = \cos^2 3x$  |  $f'(x) = -3 \sin 6x$

b)  $f(x) = \sin^3(5x-3)$  |  $f'(x) = 3 \sin^2(5x-3) \cos(5x-3) \cdot 5$

c)  $f(x) = \ln \sin x$  |  $f'(x) = \cotg x$

d)  $f(x) = \sqrt{\frac{1 - \sin x}{1 + \sin x}}$  |  $f'(x) = \frac{-1}{1 + \sin x}$

e)  $f(x) = \frac{x^2+1}{(1-x)^2}$  |  $f'(x) = \frac{2(x+1)}{(1-x)^3}$

f)  $f(x) = \ln \frac{e^x}{x^2+1}$  |  $f'(x) = \frac{(x-1)^2}{x^2+1}$

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

h)  $f(x) = \frac{\cos^2 x}{1 + \sin^2 x}$  |  $f'(x) = -\frac{2 \sin 2x}{(1 + \sin^2 x)^2}$

ch)  $f(x) = \sqrt{\sin x \cos x}$  |  $f'(x) = \frac{\cos 2x}{\sqrt{2 \sin 2x}}$

i)  $f(x) = \ln(x + \sqrt{1+x^2})$  |  $f'(x) = \frac{1}{\sqrt{1+x^2}}$