6 Math101 opgaver til 6. gang

6.1 Differentier funktionerne

$$f_1(x) = \sqrt{x^2+1}, \qquad f_2(x) = \frac{x}{2x+1}, \qquad f_3(x) = x\sin(x).$$

6.2 Differentier funktionerne:

$$f_1(x) = xe^x, \quad f_2(x) = 2x^2\cos(x), \quad f_3(x) = \ln(x)e^x, \quad f_4(x) = \sin(x)\cos(x).$$

6.3 Differentier funktionerne (lad evt. være med at forkorte):

$$f_1(x) = \frac{x}{x-1}, \qquad f_2(x) = \frac{x^2-x+1}{3x+2}, \qquad f_3(x) = \frac{x^2}{x^3-2x^2}.$$

6.4 Differentier funktionerne

$$f_1(x) = (3x-1)^{\frac{4}{3}}, \quad f_2(x) = \ln(x^2+3x), \quad f_3(x) = e^{2-x}, \quad f_4(x) = \sin(x^3).$$

6.5 Bestem den afledede af funktionen $f(x) = (x-1)e^x$.

6.6 Bestem den afledede af funktionen $f(x) = x\ln(x) - x$.

6.7 Differentier funktionerne

$$f_1(x) = e^{x^3}, \quad f_2(x) = \cos^2(x), \quad f_3(x) = \sin^3(x) \quad f_4(x) = 2\tan(x^2).$$

6.8 Vis at

$$\frac{d}{dx}\tan x = 1 + \tan^2 x.$$

(Hint: Brug $\tan x = \frac{\sin x}{\cos x}$)

6.9 Differentier funktionen $f(x) = \frac{xe^x}{\cos(x)}$.

6.10 Differentier funktionen

$$f(x) = \cos^2(\sqrt{x^2+1}).$$

6.11 Differentier funktionerne

$$f_1(x) = \frac{\cos^2(x)}{\sin(x)}, \qquad f_2(x) = \frac{e^{x^2}}{x}, \qquad f_3(x) = \frac{x\cos(x)}{e^x}$$

6.12 Differentier funktionerne

$$f(x) = \frac{x^2e^x}{-x\ln(x)}, \quad g(x) = xe^x\ln x, \quad h(x) = \tan(x)e^x\cos(x)x^2$$