

Matematik B Onsdag 21/10 2015

- Fremmødereregistrering. Opsamling fra sidst
- Aflevering nr. 08 afleveres.
- Nyt stof: Differentialregning:
 - $f'(x)$ formel for tangenthældning
 - Tangentbestemmelse.
 - Formelsamling (119) + (125)-(131)
 - Opgaver: BB>Filer>Opgaver>Tangentbestemmelse for grundfunktioner.

Se mod øst før solopgang! 21. oktober 2015



Opgave 4 (5 %)

En linje l indeholder punkterne $P(-1, -3)$ og $Q(2, 3)$.

- a) Bestem en ligning for linjen l .

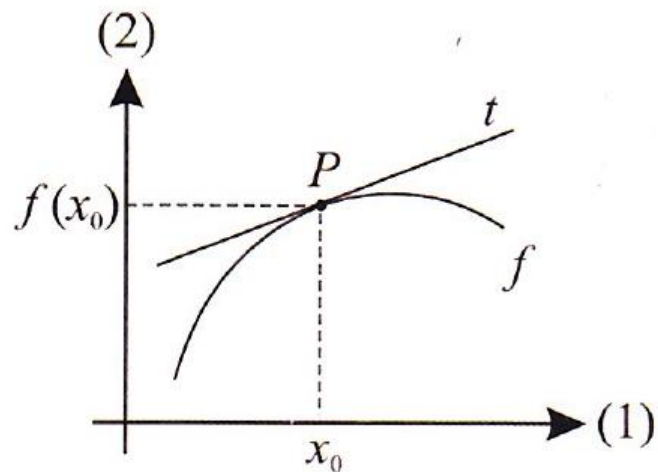
Opgave 2 (5 %)

$$x=0 \quad \checkmark = \frac{1}{2}$$

En funktion f er givet ved: $f(x) = 2x^2 - x = x(2x - 1)$

a) Bestem en ligning for tangenten til grafen for f i punktet $P(1, f(1))$.





Ligning for tangenten t til grafen for f i $P(x_0, f(x_0))$

$$f'(x) = \text{OPSLAG}$$

$$(119) \quad y = f'(x_0)(x - x_0) + f(x_0)$$

$$\textcircled{3} \quad \boxed{= a(x - x_0) + y_0,}$$

hvor $\boxed{a = f'(x_0)}$ og $\boxed{y_0 = f(x_0)}$

$\textcircled{2}$
 $\textcircled{1}$

DIFF. \rightarrow MAT A



sin	cos	tan	csc	sec	cot
sin ⁻¹	cos ⁻¹	tan ⁻¹	csc ⁻¹	sec ⁻¹	cot ⁻¹



Funktion

Afledet funktion

$$y = f(x)$$

$$y' = f'(x) = \frac{dy}{dx}$$

Logaritmefunktion

(125)

$$\ln x$$

$$\frac{1}{x} = x^{-1}$$

Ekspontialfunktioner

(126)

$$e^x$$

$$e^x$$

(127)

$$e^{kx}$$

$$k \cdot e^{kx}$$

(128)

$$a^x$$

$$a^x \cdot \ln a$$

$f(x) = 3^x$
 $f'(x) = 3^x \cdot \ln(3)$

(129)

$$x^a$$

$$a \cdot x^{a-1}$$

Potensfunktioner

(130)

$$\frac{1}{x} = x^{-1}$$

$$-\frac{1}{x^2} = -x^{-2}$$

(131)

$$\sqrt{x} = x^{\frac{1}{2}}$$

$$\frac{1}{2\sqrt{x}} = \frac{1}{2}x^{-\frac{1}{2}}$$

Handwritten flourish

$$f(x) = x^3 \quad f'(x) = 3x^{3-1} = 3x^2$$

Find TANGENTEN ZU GRAFEN I

PUNKT $(x_0, y_0) = (1, f(1)) = \underline{\underline{(1, 1)}}$

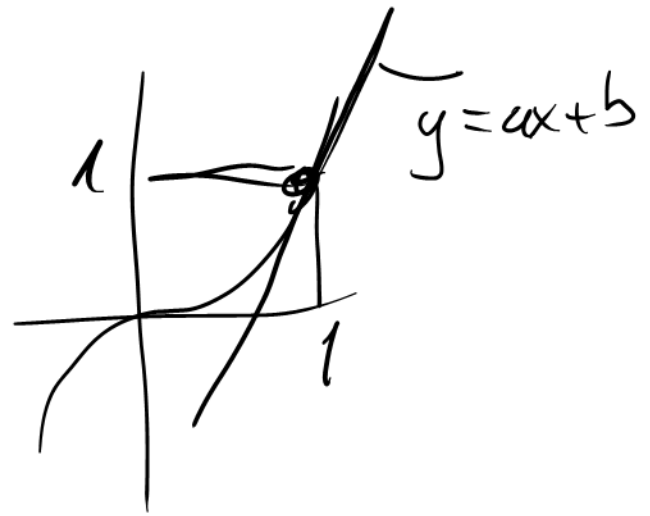
$\boxed{x=1}$ $\therefore y = f(1) = 1^3 = 1$

$\rightarrow \underline{f'(x) = 3x^2}$

$a = f'(1) = 3 \cdot 1^2 = \underline{\underline{3}}$

$(y = a \cdot (x - x_0) + y_0)$

$y = 3 \cdot (x - 1) + 1 = 3x - 3 + 1 = \underline{\underline{y = 3x - 2}}$



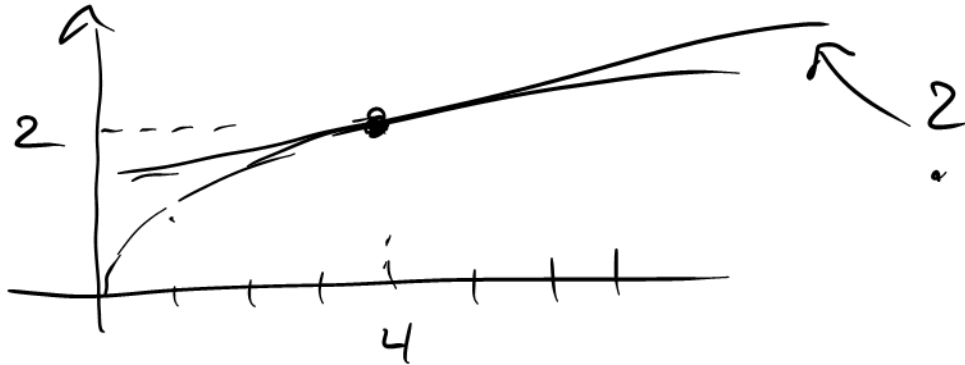
$$f(x) = \sqrt{x}$$

FIND TANGENT

FOR $x = 4$

$$y = f(4) = \sqrt{4} = 2$$

$$(x_0, y_0) = \underline{(4, 2)}$$



$$a = f'(4) = \frac{1}{2\sqrt{4}} = \frac{1}{2 \cdot 2} = \frac{1}{4}$$

$$\begin{aligned} f(x) &= \sqrt{x} = x^{\frac{1}{2}} \\ f'(x) &= \frac{1}{2} x^{-\frac{1}{2}} \\ &= \frac{1}{2\sqrt{x}} \end{aligned}$$

$$y = a(x - x_0) + y_0$$

$$y = \frac{1}{4}(x - 4) + 2 = \frac{1}{4}x - \frac{1}{4}4 + 2$$

$$\underline{\underline{y = \frac{1}{4}x + 1}}$$

$$(4y = x + 4)$$

