**Matte alle Formel ark**

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# Separasjon av variabler

$\frac{dy}{dx} = f(x)g(y)$
$\frac{1}{g(y)}\,dy = f(x)\,dx$
$\int \frac{1}{g(y)}\,dy = \int f(x)\,dx$

# Generelle løsninger av lineære differensialligninger

En lineær differensialligning på formen: $\frac{dy}{dx} + P(x)y = Q(x)$
har den generelle løsningen: $y(x) = e^{-\int P(x)\,dx}\left(\int Q(x)e^{\int P(x)\,dx}\,dx + C\right)$

# Eksponentiell vekst og logistisk vekst

### Eksponentiell omskriving av logaritmer

$\ln\left|\frac{a+u}{a-u}\right| = t + C \implies \frac{a+u}{a-u} = Ke^t$

### Eksponentiell vekst eller forfall

Differensialligningen: $\frac{dy}{dt} = ky$
har løsningen: $y(t) = Ce^{kt}$

### Logistisk vekst

Differensialligningen: $\frac{dy}{dt} = ky\left(1 - \frac{y}{M}\right)$
har løsningen: $y(t) = \frac{M}{1+Ce^{-kt}}$

# Trigonometriske substitusjoner

Ved integrasjon av komplekse uttrykk kan trigonometriske substitusjoner forenkle prosessen:

- For $\sqrt{a^2 - x^2}$, bruk substitusjonen $x = a\sin\theta$.
- For $\sqrt{x^2 - a^2}$, bruk substitusjonen $x = a\sec\theta$.
- For $\sqrt{a^2 + x^2}$, bruk substitusjonen $x = a\tan\theta$.

# Important derivations and rules

$\frac{d}{dx}f\big(g(x)\big) = f'\big(g(x)\big)\cdot g'(x)$.
$\frac{d}{dx}\big(C\cdot f(x)\big) = C\cdot\frac{d}{dx}f(x)$,

**Trigonometric functions**
$\int\cos(kx)dx = \frac{1}{k}\sin(kx) + C$
$\int\sin(kx)dx = -\frac{1}{k}\cos(kx) + C$
$\int\tan(x)dx = -ln\,|\cos(x)| + C$
$\int(1+\tan^2(x))dx = \tan(x) + C$
$\int\frac{1}{\cos^2(x)}dx = \tan(x) + C$
$\int\sin^2(x)\,dx = -\frac{1}{4}\sin(2x) - \frac{x}{2} + C.$
$\int\cos^2(x)dx = \frac{1}{4}\sin(2x) + \frac{x}{2} + C$
$\int\tan^2(x)dx = \tan(x) - x + C$

**Sine and Cosine Powers and Products:** $\sin^3(x) = \frac{3}{4}\sin(x) - \frac{1}{4}\sin(3x)$
$\sin(3x) = 3\sin(x) - 4\sin^3(x)$
$\cos(3x) = 4\cos^3(x) - 3\cos(x)$
$\sin^2(x) = \frac{1}{2}(1-\cos(2x))$
$\cos^2(x) = \frac{1}{2}(1+\cos(2x))$

$\cos(2x) = \cos^2(x) - \sin^2(x) = 2\cos^2(x) - 1 = 1 - 2\sin^2(x)$
$\sin(2x) = 2\sin(x)\cos(x)$
$\tan(2x) = \frac{2\tan(x)}{1-\tan^2(x)}$

**Cotangent Definition:** $\cot(\theta) = \frac{\cos(\theta)}{\sin(\theta)}$

**Addition formulas for cosine:**
$\cos(x+y) = \cos(x)\cos(y) - \sin(x)\sin(y)$
$\cos(x-y) = \cos(x)\cos(y) + \sin(x)\sin(y)$

**Partial Derivatives of a Function $f(x, y)$:**
$\frac{\partial f}{\partial x}\bigg|_{x=x_0,y=y_0} = \lim_{h\to 0}\frac{f(x_0+h,y_0)-f(x_0,y_0)}{h}$

$\frac{\partial f}{\partial y}\bigg|_{x=x_0,y=y_0} = \lim_{h\to 0}\frac{f(x_0,y_0+h)-f(x_0,y_0)}{h}$

**Euler's Formulas for Cosine and Sine:** $\cos(x) = \frac{e^{ix}+e^{-ix}}{2}$, $\sin(x) = \frac{e^{ix}-e^{-ix}}{2i}$

**Euler's Formula**
$e^{\pm ix} = \cos(x) \pm i\sin(x)$
Specific Forms of Euler's Formula (see +- syntax) $e^{-ix} = \cos(x) - i\sin(x)$
$e^{ix} = \cos(x) + i\sin(x)$

# Calculation rules compressed

## Rules for complex konjugates

$z = a + bi \quad \Rightarrow \quad \overline{z} = a - bi$
$\overline{z_1 + z_2} \quad \Rightarrow \quad \overline{z_1} + \overline{z_2}$
$\overline{z_1 - z_2} \quad \Rightarrow \quad \overline{z_1} - \overline{z_2}$
$\overline{z_1 z_2} \quad \Rightarrow \quad \overline{z_1} \cdot \overline{z_2}$
$\overline{\frac{z_1}{z_2}} \quad \Rightarrow \quad \frac{\overline{z_1}}{\overline{z_2}}, \quad z_2 \neq 0$
$z \in \mathbb{R} \quad \Rightarrow \quad \overline{z} = z$
$\overline{i} \quad \Rightarrow \quad -i$
$\overline{e^z} \quad \Rightarrow \quad e^{\overline{z}}$
$|\overline{z}| \quad \Rightarrow \quad |z|$
$\overline{\overline{z}} \quad \Rightarrow \quad z$
$\overline{\langle \psi, \phi \rangle} \quad \Rightarrow \quad \langle \phi, \psi \rangle$

## Imaginary numbers

$i^2 = -1$
$z = a + bi, \quad \text{where } a, b \in \mathbb{R}$
$|z| = \sqrt{a^2 + b^2}$
$\overline{z} = a - bi$
$z \cdot \overline{z} = |z|^2 = a^2 + b^2$
$e^{i\theta} = \cos(\theta) + i\sin(\theta)$
$|e^{i\theta}| = 1$
$\left(e^{i\theta}\right)^2 = e^{i(2\theta)}$
$z^n = 1 \implies z_k = e^{i\frac{2\pi k}{n}}, \quad k = 0, 1, 2, \ldots, n-1$
$z_1 = r_1 e^{i\theta_1}, \quad z_2 = r_2 e^{i\theta_2} \implies z_1 \cdot z_2 = r_1 r_2 e^{i(\theta_1+\theta_2)} \; \frac{z_1}{z_2} = \frac{r_1}{r_2} e^{i(\theta_1-\theta_2)}$
$\left(e^{i\theta}\right)^n = e^{in\theta} = (\cos\theta + i\sin\theta)^n = \cos(n\theta) + i\sin(n\theta)$

## Logarithmic Rules

$\log_b(xy) = \log_b(x) + \log_b(y)$
$\log_b\left(\frac{x}{y}\right) = \log_b(x) - \log_b(y)$
$\log_b(x^k) = k \cdot \log_b(x)$
$\log_b(1) = 0$
$\log_b(b) = 1$
$\log_b(x) = \frac{\ln(x)}{\ln(b)}$
$\ln(e^x) = x$
$\ln(1) = 0$
$\ln(ab) = \ln(a) + \ln(b)$
$\ln\left(\frac{a}{b}\right) = \ln(a) - \ln(b)$
$\ln(a^k) = k \cdot \ln(a)$

## Rules for absolute value

$|ab| = |a| \cdot |b|$
$\left|\frac{a}{b}\right| = \frac{|a|}{|b|}, \quad b \neq 0$
$|a + b| \leq |a| + |b|$ (Trekantulikheten)
$||a| - |b|| \leq |a - b|$
$||a|| = |a|$
$|a| = 0 \quad \Leftrightarrow \quad a = 0$
$|a|^2 = a^2$
$a(x) \in \mathbb{R}_{\geq 0} \implies |a(x)| = a(x)$

## Rules for summation

$\sum_{i=1}^n (a + b) = \sum_{i=1}^n a + \sum_{i=1}^n b$
$\sum_{i=1}^n c \cdot a_i = c \cdot \sum_{i=1}^n a_i, \quad \text{if } c \text{ is constant.}$
$\sum_{i=1}^n c = n \cdot c, \quad \text{if } c \text{ is constant.}$
$\sum_{i=1}^n (a_i \cdot b_i) \neq \left(\sum_{i=1}^n a_i\right) \cdot \left(\sum_{i=1}^n b_i\right), \quad \text{(not always equal!)}$
$\sum_{i=1}^n i = \frac{n(n+1)}{2}$
$\sum_{i=1}^n i^2 = \frac{n(n+1)(2n+1)}{6}$
$\sum_{i=1}^n (X_i - \bar{X}) X_i = \sum_{i=1}^n (X_i - \bar{X})^2$
$\sum_{i=1}^n (X_i - \bar{X})^2 = \sum_{i=1}^n X_i^2 - n\bar{X}^2$
$\sum_{i=1}^n (aX_i + b)^2 = a^2 \sum_{i=1}^n X_i^2 + 2ab \sum_{i=1}^n X_i + nb^2$
$\sum_{i=1}^n (x_i - \bar{x}) = 0 \; \bar{X} = \frac{1}{n} \sum_{i=1}^n X_i$
$\mathrm{Cov}(X, Y) = \frac{1}{n} \sum_{i=1}^n (X_i - \bar{X})(Y_i - \bar{Y})$
$\mathrm{Var}(X) = E(X^2) - E(X)^2$
$\mathrm{Var}(aX + b) = a^2 \mathrm{Var}(X)$

## Rules for expectation $E$

$E(c) = c, \quad \text{if } c \text{ is constant.}$
$E(a + b) = E(a) + E(b)$
$E(c \cdot a) = c \cdot E(a), \quad \text{if } c \text{ is constant.}$
$E(a \cdot b) = E(a) \cdot E(b), \quad \text{if } a \text{ and } b \text{ are independent.}$
$E\left(\sum_{i=1}^n a_i\right) = \sum_{i=1}^n E(a_i)$
$E(a^2) = \mathrm{Var}(a) + E(a)^2$
$E\left(\frac{a}{b}\right) \neq \frac{E(a)}{E(b)}, \quad$ (not always equal, except in special case
$E(g(a)) = \int_{-\infty}^{\infty} g(x) f_a(x)\, dx, \quad$ (for the continuous case wi
$E(g(a)) = \sum_x g(x) P(a = x), \quad$ (for the discrete case).

## Regneregler for potenser

$a^p a^q = a^{p+q}$
$\frac{a^p}{a^q} = a^{p-q}$
$a^{-q} = \frac{1}{a^q}$
$(a^p)^q = a^{p \cdot q}$
$a^{\frac{1}{p}} = \sqrt[p]{a}$
$a^p b^p = (ab)^p$
$\frac{a^p}{b^p} = \left(\frac{a}{b}\right)^p$
$a^0 = 1, \quad \text{for } a \neq 0$
$a^1 = a$
$0^p = 0, \quad \text{for } p > 0$
$1^p = 1$
$(-a)^p = \begin{cases} a^p, & \text{hvis } p \text{ er partall} \\ -a^p, & \text{hvis } p \text{ er oddetall} \end{cases}$
$a^{1/2} = \sqrt{a}$

## Regneregler for kvadratrøtter

$\sqrt{a \cdot b} = \sqrt{a} \cdot \sqrt{b}, \quad \text{for } a \geq 0, b \geq 0$
$\sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}}, \quad \text{for } a \geq 0, b > 0$
$(\sqrt{a})^2 = a, \quad \text{for } a \geq 0$
$\sqrt{a^2} = |a|$
$\sqrt[2]{a} = a^{1/2}$
$\sqrt{a^n} = a^{n/2}, \quad \text{for } a \geq 0$
$\sqrt{k \cdot a} = \sqrt{k} \cdot \sqrt{a}, \quad \text{for positiv konstant } k$
$\sqrt{a} \neq \sqrt{b} \quad \text{med mindre } a = b$
$\sqrt{a^2 + b^2} \neq \sqrt{a^2} + \sqrt{b^2} \quad \text{(ikke likhet)}$

sectionIntegration
subsectionBestemte integraler
$\int_a^b F'(x)\,dx = F(b) - F(a)$
$\int_a^b cf(x)\,dx = c\int_a^b f(x)\,dx$
$\int_a^b (f+g)\,dx = \int_a^b f\,dx + \int_a^b g\,dx$
$\int_a^b uv'\,dx = [uv]_a^b - \int_a^b u'v\,dx$
$\int_a^b f(u)u'\,dx = \int_{u(a)}^{u(b)} f(u)\,du$

subsectionImportant integrals
$\int_{-\infty}^{\infty} e^{-x^2}\,dx = \sqrt{\pi}$
$\int_{-\infty}^{\infty} e^{-ax^2}\,dx = \sqrt{\frac{\pi}{a}}, \quad a > 0$
$\int_{-\infty}^{\infty} x^2 e^{-ax^2}\,dx = \sqrt{\frac{\pi}{a}} \cdot \frac{1}{2a}, \quad a > 0$
$\int_{-\infty}^{\infty} x^{2n} e^{-ax^2}\,dx = \sqrt{\frac{\pi}{a}} \cdot \frac{(2n-1)!!}{(2a)^n}, \quad n \in \mathbb{N}_0,\ a > 0$
$\int_a^b uv'\,dx = \left[uv\right]_a^b - \int_a^b u'v\,dx$
$\int_a^b f(u)u'\,dx = \int_{u(a)}^{u(b)} f(u)\,du$
$u = ax + b \Rightarrow \frac{du}{dx} = a \Rightarrow du = a\,dx \Rightarrow dx = \frac{du}{a}$

### Egenskaper til ubestemte integral
$\int uv'\,dx = uv - \int u'v\,dx$ $\int f(u)u'\,dx = \int f(u)\,du$ $\int f(ax+b)\,dx = \frac{1}{a}F(ax+b) + C$

### Eksponentialfunksjoner
$\int e^{kx}\,dx = \frac{1}{k}e^{kx} + C, \quad k \neq 0$
$\int a^x\,dx = \frac{a^x}{\ln(a)} + C, \quad a > 0, a \neq 1$

### Trigonometriske funksjoner
$\int \sin(kx)\,dx = -\frac{1}{k}\cos(kx) + C$
$\int \cos(kx)\,dx = \frac{1}{k}\sin(kx) + C$
$\int \sec^2(kx)\,dx = \frac{1}{k}\tan(kx) + C$
$\int \csc^2(kx)\,dx = -\frac{1}{k}\cot(kx) + C$
$\int \sec(kx)\tan(kx)\,dx = \frac{1}{k}\sec(kx) + C$
$\int \csc(kx)\cot(kx)\,dx = -\frac{1}{k}\csc(kx) + C$

### Hyperbolske funksjoner
$\int \sinh(kx)\,dx = \frac{1}{k}\cosh(kx) + C$
$\int \cosh(kx)\,dx = \frac{1}{k}\sinh(kx) + C$

### Inverse trigonometriske funksjoner
$\int \frac{1}{\sqrt{a^2-x^2}}\,dx = \arcsin\left(\frac{x}{a}\right) + C$
$\int \frac{1}{1+x^2}\,dx = \arctan(x) + C$

### Logaritmiske funksjoner
$\int \frac{1}{x}\,dx = \ln|x| + C$
$\int \ln(x)\,dx = x\ln(x) - x + C$

### Potensfunksjoner
$\int x^n\,dx = \frac{x^{n+1}}{n+1} + C, \quad n \neq -1$

### Spesielle integraler
$\int \frac{1}{\sqrt{x^2+a^2}}\,dx = \ln\left|x + \sqrt{x^2+a^2}\right| + C$
$\int \frac{1}{\sqrt{x^2-a^2}}\,dx = \ln\left|x + \sqrt{x^2-a^2}\right| + C, \quad x > a$
$\int x^r\,dx = \frac{x^{r+1}}{r+1} + C,\ r \neq -1$
$\int \frac{1}{x}\,dx = \ln|x| + C$
$\int e^x\,dx = e^x + C$
$\int e^{kx}\,dx = \frac{1}{k}e^{kx} + C,\ k \neq 0$
$\int \sin x\,dx = -\cos x + C$
$\int \cos x\,dx = \sin x + C$
$\int \frac{1}{\cos^2 x}\,dx = \tan x + C$
$\int \frac{1}{\sqrt{1-x^2}}\,dx = \sin^{-1} x + C$
$\int \frac{1}{1+x^2}\,dx = \tan^{-1} x + C$

### Rotasjon om $x$-aksen
$A_x = 2\pi\int_a^b |f(x)|\sqrt{1+(f'(x))^2}\,dx$
$V_x = \pi\int_a^b f(x)^2\,dx$

### Rotasjon om $y$-aksen
$V_y = 2\pi\int_a^b x|f(x)|\,dx$

### Gjennomsnitt
$\bar{y} = \frac{1}{b-a}\int_a^b y(x)\,dx$

## Trigonemetriske funksjoner

### Eksakte verdier til sin og cos

| $u$ | $u$ | $\sin u$ | $\cos u$ | $\tan u$ |
|---|---|---|---|---|
| $0$ | $0^\circ$ | $0$ | $1$ | $0$ |
| $\pi/6$ | $30^\circ$ | $1/2$ | $\sqrt{3}/2$ | $1/\sqrt{3}$ |
| $\pi/4$ | $45^\circ$ | $\sqrt{2}/2$ | $\sqrt{2}/2$ | $1$ |
| $\pi/3$ | $60^\circ$ | $\sqrt{3}/2$ | $1/2$ | $\sqrt{3}$ |
| $\pi/2$ | $90^\circ$ | $1$ | $0$ | $-$ |

**Trigonometriske formler**

$1 = \sin^2 u + \cos^2 u$

$\tan u = \frac{\sin u}{\cos u}$

$\sin u = \sin(u + 2\pi n), \quad n \in \mathbb{Z}$

$\cos u = \cos(u + 2\pi n), \quad n \in \mathbb{Z}$

$\tan u = \tan(u + \pi n), \quad n \in \mathbb{Z}$

$\sin(\pi - u) = \sin u$

$\cos(-u) = \cos u$

$-\sin(u) = \sin(-u)$

$\cos^2 u = \frac{1+\cos(2u)}{2}$

$\sin^2 u = \frac{1-\cos(2u)}{2}$

$\sin(u + v) = \sin u \cos v + \cos u \sin v$

$\cos(u + v) = \cos u \cos v - \sin u \sin v$

$\sin(2u) = 2 \sin u \cos u$

$\cos(2u) = \cos^2 u - \sin^2 u$

# Derivatives

### Derivasjons regler

$(u+v)' = u' + v'$
$(u-v)' = u' - v'$
$(cu(x))' = cu'(x)$
$(uv)' = u'v + uv'$
$(\frac{u}{v})' = \frac{u'v - uv'}{v^2}$
$(u \circ v)' = u'(v) \cdot v'$
$(u^{-1})' = -\frac{u'}{u^2}$
$(u^n)' = nu^{n-1}u'$
$(e^u)' = u'e^u$
$(a^u)' = u'a^u \ln(a)$
$(\ln(u))' = \frac{u'}{u}$
$(\log_a(u))' = \frac{u'}{u \ln(a)}$
$(\sin(u))' = u' \cos(u)$
$(\cos(u))' = -u' \sin(u)$
$(\tan(u))' = u' \sec^2(u)$
$(\cot(u))' = -u' \csc^2(u)$
$(\sec(u))' = u' \sec(u) \tan(u)$
$(\csc(u))' = -u' \csc(u) \cot(u)$
$(\arcsin(u))' = \frac{u'}{\sqrt{1-u^2}}$
$(\arccos(u))' = -\frac{u'}{\sqrt{1-u^2}}$
$(\arctan(u))' = \frac{u'}{1+u^2}$

### Important Derivatives

$\frac{d}{dx}(c) = 0$
$\frac{d}{dx}(x) = 1$
$\frac{d}{dx}(x^n) = nx^{n-1}$
$\frac{d}{dx}(e^x) = e^x$
$\frac{d}{dx}(a^x) = a^x \ln(a)$
$\frac{d}{dx}(\ln(x)) = \frac{1}{x}$
$\frac{d}{dx}(\log_a(x)) = \frac{1}{x \ln(a)}$
$\frac{d}{dx}(\sin(x)) = \cos(x)$
$\frac{d}{dx}(\cos(x)) = -\sin(x)$
$\frac{d}{dx}(\tan(x)) = \sec^2(x)$
$\frac{d}{dx}(\cot(x)) = -\csc^2(x)$
$\frac{d}{dx}(\sec(x)) = \sec(x) \tan(x)$
$\frac{d}{dx}(\csc(x)) = -\csc(x) \cot(x)$
$\frac{d}{dx}(\arcsin(x)) = \frac{1}{\sqrt{1-x^2}}$
$\frac{d}{dx}(\arccos(x)) = -\frac{1}{\sqrt{1-x^2}}$
$\frac{d}{dx}(\arctan(x)) = \frac{1}{1+x^2}$

# Differensialligning ansatser

## Homogene ligninger

Ansatser for $y'' + by' + cy = 0$: $y = e^{\lambda x}$
$y = C_1 e^{\lambda_1 x} + C_2 e^{\lambda_2 x}$
$y = e^{\alpha x}(C_1 \cos(\beta x) + C_2 \sin(\beta x))$
$y = (C_1 + C_2 x)e^{\lambda x}$

## Inhomogene ligninger

Ansatser for $g(x)$: $y_p = B_0 + B_1 x + \cdots + B_n x^n$
$y_p = Ce^{ax}$
$y_p = Cxe^{ax}$
$y_p = C_1 \cos(ax) + C_2 \sin(ax)$
$y_p = x(C_1 \cos(ax) + C_2 \sin(ax))$
$y_p = e^{ax}(R_n(x)\cos(bx) + S_n(x)\sin(bx))$

## Ikke-lineære ligninger

$\frac{dy}{dx} = g(x)h(y)$ $z = y^{1-n}$ $y = vx, \quad v = \frac{y}{x}$ $y = \frac{1}{z}$ $y = e^z$

## Spesialtilfeller

$y = x^r$ $y = A\cos(kx) + B\sin(kx)$ $y = e^{kx}$

## Statistikk

# Matriser

$$\begin{vmatrix} a & b \\ c & d \end{vmatrix} = ad - bc$$

$$\begin{bmatrix} a & b \\ c & d \end{bmatrix}^{-1} = \frac{1}{ad-bc} \begin{bmatrix} d & -b \\ -c & a \end{bmatrix}$$

## Vektorer

## Geometri

## Kvantemekanikk

## Div matte

Rett linje: $y - y_0 = a(x - x_0)$
Sirkel: $(x - x_0)^2 + (y - y_0)^2 = r^2$

## Numeriske metoder

**Numerisk løsning av startverdiproblem**

$y' = F(x, y), \quad y(x_0) = y_0$

$x_n = x_0 + n \cdot h$ og $y(x_n) \approx y_n$ med

**Eulers metode:**

$y_{n+1} = y_n + F(x_n, y_n)h$

**Eulers midtpunktmetode:**

$y_{n+1} = y_n + F(\hat{x}_n, \hat{y}_n)h$

der

$\hat{x}_n = x_n + h/2$ og $\hat{y}_n = y_n + F(x_n, y_n)h/2$

**Numerisk integrasjon**

**Trapesmetoden**

$\int_a^b f(x)\,dx \approx T_n$ der

$T_n = h\left(\frac{f(x_0)}{2} + f(x_1) + \cdots + f(x_{n-1}) + \frac{f(x_n)}{2}\right)$

**Simpsons metode**

$\int_a^b f(x)\,dx \approx S_n$ der

$S_n = \frac{h}{3}\left(f(x_0) + 4f(x_1) + 2f(x_2) + \cdots + 4f(x_{n-1}) + f(x_n)\right)$

**Newtons metode**

$x_{n+1} = x_n - \frac{f(x_n)}{f'(x_n)}$

**Trapesmetoden**

$\int_a^b f(x)\,dx \approx T_n$ der

$T_n = h\left(\frac{f(x_0)}{2} + f(x_1) + \cdots + f(x_{n-1}) + \frac{f(x_n)}{2}\right)$

**Simpsons metode**

$\int_a^b f(x)\,dx \approx S_n$ der

$S_n = \frac{h}{3}\left(f(x_0) + 4f(x_1) + 2f(x_2) + \cdots + 4f(x_{n-1}) + f(x_n)\right)$

**Rotasjon om $x$-aksen**

$A_x = 2\pi \int_a^b |f(x)|\sqrt{1 + (f'(x))^2}\,dx$

$V_x = \pi \int_a^b f(x)^2\,dx$

**Rotasjon om $y$-aksen**

$V_y = 2\pi \int_a^b x|f(x)|\,dx$

**Gjennomsnitt**

$\bar{y} = \frac{1}{b-a}\int_a^b y(x)\,dx$

**Newtons metode**

$x_{n+1} = x_n - \frac{f(x_n)}{f'(x_n)}$

## numpy

```
np.mean(data)
np.median(data)
np.std(data)
np.var(data)
np.percentile(data, 25)
np.corrcoef(data1, data2)
np.cov(data1, data2)
np.histogram(data)
np.histogram2d(data1, data2)
np.histogram_bin_edges(data)
np.histogramdd(data)
np.sqrt(data) 2rot
np.cbrt 3rot, 4rot potens++
np.exp(data)
np.log(data) 2,10 osv..
np.sin(data) osv..
```