Formelark MA-111

Brøk

$\frac{\frac{a}{b}}{\frac{c}{d}} = \frac{a}{b} \cdot \frac{d}{c}$ | $\frac{a}{b} \cdot \frac{c}{d} = \frac{a \cdot c}{b \cdot d}$

Potenser

$a^{-n} = \frac{1}{a^n}$ | $a^n \cdot a^m = a^{n+m}$ | $\frac{a^n}{a^m} = a^{n-m}$ | $(a^n)^m = a^{n \cdot m}$

Røtter

$\sqrt{a} = a^{\frac{1}{2}}$ | $\sqrt[m]{a^n} = a^{\frac{n}{m}}$ | $\sqrt{a \cdot b} = \sqrt{a} \cdot \sqrt{b}$ | $\sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}}$

Kvadratsetninger

1. $(a+b)^2 = a^2 + 2ab + b^2$
2. $(a-b)^2 = a^2 - 2ab + b^2$
3. $(a+b)(a-b) = a^2 - b^2$

Funksjoner og grafer

Linær funksjon:
$f(x) = ax + b$

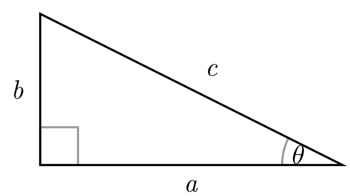
Dersom $f(x)$ er standardfunksjon:
$f(x-a)$ + b $\longrightarrow$ a gir oss forflytning langs x-aksen, b gir oss forflytning langs y-aksen.

Likning for en sirkel med radius R:
$x^2 + y^2 = R^2$

Likning for en ellipse:
$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$

Likning for en superellipse:
$|\frac{x}{a}|^n + |\frac{y}{b}|^n = 1$

Trigonometri



Pytagorassetningen:

$a^2 + b^2 = c^2$

Sinus, cosinus og tangens:

$\sin\theta = \frac{b}{c}$ | $\cos\theta = \frac{a}{c}$ | $\tan\theta = \frac{b}{a}$

Grader og radianer:

$\theta_g = \theta_r \frac{180^o}{\pi}$ | $\theta_r = \theta_g \frac{\pi}{180^o}$

Lineær algebra

$\mathrm{tr(M)} = m_{11} + m_{22}$

$\det(\mathrm{M}) = m_{11}m_{22} - m_{12}m_{21}$

$g = \frac{1}{2}(m_{11} + m_{22} \pm \sqrt{(m_{11} - m_{22})^2 + 4m_{12}^2})$

$$\vec{u} = \begin{bmatrix} m_{12} \\ g - m_{11} \end{bmatrix}$$

$$\mathbf{R}(\theta) = \begin{bmatrix} \cos\theta & -\sin\theta \\ \sin\theta & \cos\theta \end{bmatrix}$$

$$\mathbf{T}(\mathbf{p}) = \begin{bmatrix} 1 & 0 & p_1 \\ 0 & 1 & p_2 \\ 0 & 0 & 1 \end{bmatrix}$$

Rotasjon i rommet: $\mathbf{R}(\vec{n}, \theta) = \mathbf{I}\cos\theta + \mathbf{N}(1\text{-} \cos\theta) + \mathbf{A}\sin\theta$, der

$$\mathbf{I} = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix} \quad \mathbf{N} = \begin{bmatrix} n_1^2 & n_1n_2 & n_1n_3 \\ n_2n_1 & n_2^2 & n_2n_3 \\ n_3n_1 & n_3n_2 & n_3^2 \end{bmatrix} \quad \mathbf{A} = \begin{bmatrix} 0 & -n_3 & n_2 \\ n_3 & 0 & -n_1 \\ -n_2 & n_1 & 0 \end{bmatrix}$$