Vigrar

Ef $A=(x_1, y_1)$ og $B=(x_2, y_2)$ þá er $\overline{AB}=\begin{pmatrix} x_2-x_1 \\ y_2-y_1 \end{pmatrix}$

Ef $\bar{a}=\begin{pmatrix} x \\ y \end{pmatrix}$ þá er **hallatala** $h_a=\frac{y}{x}$, **lengd** $|\bar{a}|=\sqrt{x^2+y^2}$ **þvervigur** $\bar{a}_p=\begin{pmatrix} -y \\ x \end{pmatrix}$ og $t\cdot\bar{a}=\begin{pmatrix} t\cdot x \\ t\cdot y \end{pmatrix}$

Ef $\bar{a}=\begin{pmatrix} x_1 \\ y_1 \end{pmatrix}$ og $\bar{b}=\begin{pmatrix} x_2 \\ y_2 \end{pmatrix}$ þá er **summan** $\bar{a}+\bar{b}=\begin{pmatrix} x_1+x_2 \\ y_1+y_2 \end{pmatrix}$ og

innfeldið $\bar{a}\cdot\bar{b}=x_1\cdot x_2+y_1\cdot y_2$ og hornréttir vigrar $\bar{a}\perp\bar{b}\Leftrightarrow\bar{a}\cdot\bar{b}=0$

Samsíða vigrar hafa sömu hallatölu.

Innskotsreglan $\overline{AB}=\overline{AC}+\overline{CB}$

Lengd og innfeldi:

$|\bar{a}|^2=\bar{a}\cdot\bar{a}$ $|\bar{a}+\bar{b}|^2=|\bar{a}|^2+|\bar{b}|^2+2\,\bar{a}\cdot\bar{b}$ $|\bar{a}-\bar{b}|^2=|\bar{a}|^2+|\bar{b}|^2-2\,\bar{a}\cdot\bar{b}$

Einingarvigrar

$\bar{e}=\frac{1}{|\bar{a}|}\cdot\bar{a}=\begin{pmatrix} x/|\bar{a}| \\ y/|\bar{a}| \end{pmatrix}$ $\bar{e}\cdot|\bar{a}|=\bar{a}$ $\bar{e}_v=\begin{bmatrix} \cos(v) \\ \sin(v) \end{bmatrix}$ $\bar{i}=\begin{bmatrix} 1 \\ 0 \end{bmatrix}$, $\bar{j}=\begin{bmatrix} 0 \\ 1 \end{bmatrix}$

Stefnuhorn vigurs

1. fjórðungur $v=\tan^{-1}\left(\frac{a_2}{a_1}\right)$

2. fjórðungur $v=180+\tan^{-1}\left(\frac{a_2}{a_1}\right)$

3. fjórðungur $v=180+\tan^{-1}\left(\frac{a_2}{a_1}\right)$

4. fjórðungur $v=360+\tan^{-1}\left(\frac{a_2}{a_1}\right)$

Horn milli vigra

$\bar{a}\cdot\bar{b}=|\bar{a}|\cdot|\bar{b}|\cos(v)$, $\bar{a}_p\cdot\bar{b}=|\bar{a}|\cdot|\bar{b}|\sin(v)$

Ákveða vigra

$\det(\bar{a},\bar{b})=\begin{vmatrix} a_1 & b_1 \\ a_2 & b_2 \end{vmatrix}=a_1 b_2-a_2 b_1$

Miðpunktur línu:

Ef $A=(x_1, y_1)$ og $B=(x_2, y_2)$ er

$M=\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$

Miðpunktur þríhyrnings:

Ef $A=(x_1, y_1)$, $B=(x_2, y_2)$ og $C=(x_3, y_3)$ er

$T=\left(\frac{x_1+x_2+x_3}{3}, \frac{y_1+y_2+y_3}{3}\right)$

Lausn jöfnuhneppis:

$a_1 x+b_1 y=c_1$
$a_2 x+b_2 y=c_2$

$x=\frac{det(c,b)}{det(a,b)}=\frac{\begin{vmatrix} c_1 & b_1 \\ c_2 & b_2 \end{vmatrix}}{\begin{vmatrix} a_1 & b_1 \\ a_2 & b_2 \end{vmatrix}}=\frac{c_1\cdot b_2-c_2\cdot b}{a_1\cdot b_2-a_2\cdot b}$ $y=\frac{det(a,c)}{det(a,b)}=\frac{\begin{vmatrix} a_1 & c_1 \\ a_2 & c_2 \end{vmatrix}}{\begin{vmatrix} a_1 & b_1 \\ a_2 & b_2 \end{vmatrix}}=\frac{a_1\cdot c_2-a}{a_1\cdot b_2-a}$