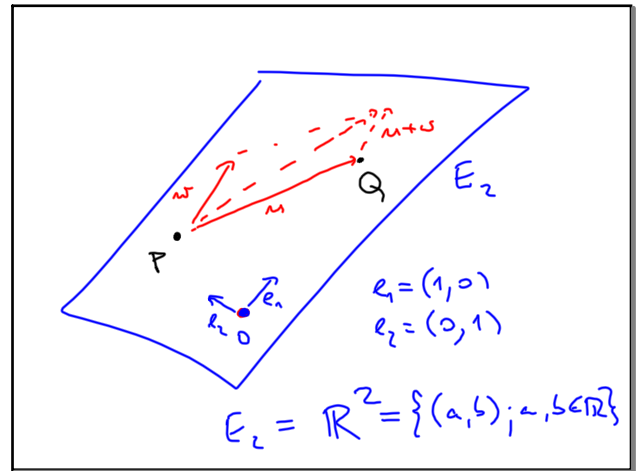


10 1-16:04



10 1-16:10

$P = [y \ 1]$ $v = (-1, 3)$
 $x(t) = 1 + (-1) \cdot t$
 $y(t) = 1 + 3 \cdot t$

$P = (x_0, y_0)$
 $v = (\alpha, \beta)$
 $w = (-\beta, \alpha)$
 $\alpha \cdot (-\beta) + \beta \cdot \alpha = 0$

$x = x_0 + \alpha t$
 $y = y_0 + \beta t$

10 1-16:14

$p: [2, 0] + t(3, 2)$
 $q: [-1, 2] + s(1, 3)$
 $p \cap q = ?$

$x = 2 + 3t = -1 + s$
 $y = 2t = 2 + 3s$
 $6 + 7t = -5$
 $7t = -11$
 $t = -\frac{11}{7}$
 $(2 - \frac{33}{7}, -\frac{22}{7}) = (-\frac{19}{7}, -\frac{22}{7})$

$x = 2 + 3t = 2 + 3(-\frac{11}{7}) = -\frac{11}{7}$
 $y = 2t = -\frac{22}{7}$
 $2(-\frac{11}{7}) - 3(-\frac{22}{7}) - 4 = 0$
 $= -\frac{22}{7} + \frac{66}{7} - 4 = 0$
 $\frac{44}{7} - 4 = 0$
 $\frac{44}{7} - \frac{28}{7} = 0$
 $\frac{16}{7} = 0$ (Incorrect, re-calculation shows $s = -\frac{12}{7}$)

10 1-16:20

2 linee p 2 psg: $\begin{cases} ax + by = r \\ cx + dy = s \end{cases}$ $A = \begin{pmatrix} a & b \\ c & d \end{pmatrix}$

$F(x, y) = \begin{pmatrix} ax + by \\ cx + dy \end{pmatrix} = \begin{pmatrix} r \\ s \end{pmatrix}$ $(0, 1) = e_2$
 $v = (x_1, y_1)$ $\alpha v = (\alpha x_1, \alpha y_1)$ $e_1 = (1, 0)$
 $w = (x_2, y_2)$ $\beta w = (\beta x_2, \beta y_2)$ $x \cdot e_1 + y \cdot e_2 = (x, y)$

$F(\alpha v + \beta w) = \alpha F(v) + \beta F(w)$
 $F(x, y) = x \cdot F(e_1) + y \cdot F(e_2)$

10 1-16:30

$\begin{pmatrix} a & b \\ c & d \end{pmatrix} \cdot \begin{pmatrix} a' & b' \\ c' & d' \end{pmatrix} = \begin{pmatrix} aa' + bc' & ab' + bd' \\ ca' + dc' & cb' + dd' \end{pmatrix}$
 $A \cdot B =$

$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix} \cdot \begin{pmatrix} a' & b' \\ c' & d' \end{pmatrix} = \begin{pmatrix} a' & b' \\ c' & d' \end{pmatrix}$

$\begin{pmatrix} x \\ y \end{pmatrix} \xrightarrow{A} A \cdot \begin{pmatrix} x \\ y \end{pmatrix} \xrightarrow{B} B \cdot (A \cdot \begin{pmatrix} x \\ y \end{pmatrix}) = (B \cdot A) \cdot \begin{pmatrix} x \\ y \end{pmatrix}$

10 1-16:38

$p: ax+by=r$
 $q: cx+dy=s$

$\sqrt{a^2+b^2}$
 $ax=b$
 $cx=d$
 x

rotation \Leftrightarrow
 $a=bc \quad | \cdot d$
 $b=ad \quad | \cdot c$

$ad-bc = d \cdot (cd-cd) = 0$

$A = \begin{pmatrix} a & b \\ c & d \end{pmatrix} \mapsto \det A = ad-bc$

$\det A \neq 0 \Leftrightarrow A \cdot u = v$ ma
 jedne plus jedno $\neq v$.

10 1-16:49

$e_1 \mapsto e_1'$
 $e_2 \mapsto e_2'$
 $0 \mapsto 0'$

(x,y) w nie ma $\sqrt{x^2+y^2}$ ✓

10 1-16:53

$u = \begin{pmatrix} x_1 \\ y_1 \end{pmatrix}$
 $v = \begin{pmatrix} x_2 \\ y_2 \end{pmatrix}$

$u \cdot v = x_1 x_2 + y_1 y_2$
 $\cos \varphi = \frac{x_1 x_2 + y_1 y_2}{\|u\| \cdot \|v\|}$

10 1-17:01

$A = \begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix} \cdot \begin{pmatrix} x \\ y \end{pmatrix}$

$(x,-y) = A \cdot \begin{pmatrix} x \\ y \end{pmatrix}$

$R_\varphi = \begin{pmatrix} \cos \varphi & -\sin \varphi \\ \sin \varphi & \cos \varphi \end{pmatrix}$

10 1-17:09

$R_\varphi \cdot Z_0 \cdot R_\varphi = \begin{pmatrix} x \\ y \end{pmatrix}$
 $= Z_0$

10 1-17:14

$\begin{pmatrix} \cos \varphi & -\sin \varphi \\ \sin \varphi & \cos \varphi \end{pmatrix} \cdot \begin{pmatrix} \cos \varphi & \sin \varphi \\ -\sin \varphi & \cos \varphi \end{pmatrix}$

$= \begin{pmatrix} \cos^2 \varphi - \sin^2 \varphi & \cos \varphi \sin \varphi + \sin \varphi \cos \varphi \\ \sin \varphi \cos \varphi + \cos \varphi \sin \varphi & \sin^2 \varphi - \cos^2 \varphi \end{pmatrix}$

$= \begin{pmatrix} \cos 2\varphi & \sin 2\varphi \\ \sin 2\varphi & -\cos 2\varphi \end{pmatrix}$

10 1-17:18

1. mišle delj 2 toži g'lat:
1 m², vgrazila v polode
2.
2 m²,

SRAZI SE ?

$2x - 3y + 4 = 0$
 $2(s-s) - 3(-2+s) + 4 = 0$
 $20 - 3s = 0 \Rightarrow s = 4$
 $P = [1, 2]$

$t_1 = \sqrt{15} s$
 $t_2 = 2\sqrt{2} s$

$\sqrt{2} t = 4$

$p: [-2, 0] + r(3, 2)$
 $q: [5, -2] + s(-1, 1)$
 $p: [-2, 0] + \frac{t}{\sqrt{15}}(3, 2)$
 $q: [5, -2] + \frac{2t}{\sqrt{2}}(-1, 1)$

10 1-17:23

$\det A = \det \begin{pmatrix} a & b \\ c & d \end{pmatrix} = ad - bc$
 $v = \begin{pmatrix} a \\ c \end{pmatrix} \quad w = \begin{pmatrix} b \\ d \end{pmatrix}$

$\det(v, w) = -\det(w, v)$
 $\det(v+w, w) = \det \begin{pmatrix} a+a' & b \\ c+c' & d \end{pmatrix} = (a+a')d - b(c+c')$
 $= (ad - bc) + (a'd - bc')$
 $= \det(v, w) + \det(v', w)$

$\det(\alpha v, w) = \alpha \cdot \det(v, w)$
 $\det(e_1, e_2) = \det \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix} = 1$
 $\det(e_1, e_2) = 1$

10 1-17:36

$S = \frac{1}{2} \|u\| \cdot \|v\| = \frac{1}{2} |\det(u, v)|$

10 1-17:41

$\square \approx \det \begin{pmatrix} -2 & -2 \\ 1 & 4 \end{pmatrix}, \begin{pmatrix} 3 & 3 \\ 2 & 1 \end{pmatrix}$

$\det \begin{pmatrix} 4 & 5 \\ 3 & 5 \end{pmatrix} = 4 \cdot 5 - 5 \cdot 3 = 5$
 $\det \begin{pmatrix} 5 & 3 \\ 5 & 6 \end{pmatrix} = 5 \cdot 6 - 3 \cdot 5 = 15$

10 1-17:46