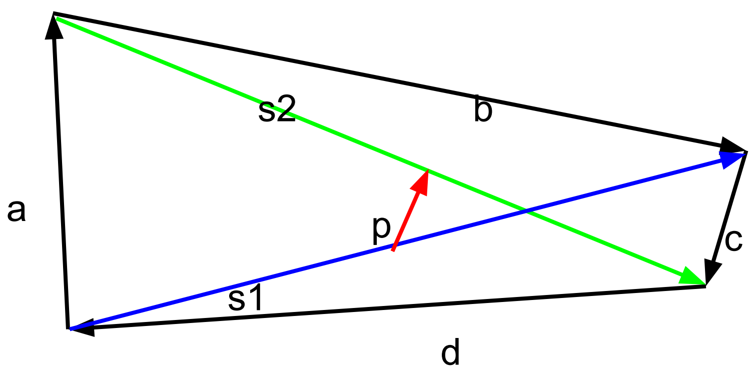
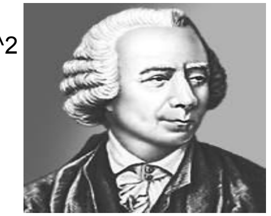
Дан произвольный выпуклый 4-х угольник. Сумма квадратов длин его сторон равна сумме квадратов его диагоналей, сложенной с учётверённым квадратом расстояния между серединами диагоналей. (Эйлер) x^2 + z^2 +k^2=d1^1 + d2^2 + 4d^2





сторона 4-х угольника + кусок диагонали до встречи с p + само p + кусок диагонали до исходной стороны 4-х угольника

a+s2/2-p-s1/2=0 a=-s2/2+p+s1/2
b-s1/2+p-s2/2=0 b=s2/2-p+s1/2
c-s2/2-p+s1/2=0 c=s2/2+p-s1/2
d+s1/2+p+s2/2=0 d=-s1/2-p-s2/2

лирическое отступление
(a,b)=|a|*|b|*cos(a,b)
a {x1,x2} b{y1,y2} x1*x2+y1*y2=|a|*|b|*cos(a,b)

(a,b)=(b,a) (a,b+c)=(a,b)+(a,c)
(a,a)=a^2 (ka,b)=k(a,b)

(a+b+c)^2=a^2+b^2+c^2+
+2ab+2ac+2bc

a^2=s2^2/4 * cos(-s2/2;-s2/2)-s2p/2 * cos (p; -s2/2) +s2s1/4 * cos (-s2/2;-s1/2)-ps2/2 * cos(-s2/2;p)+ p^2 * cos(p;p) - ps1/2 * cos (p;-s1/2)+s1^2/4 cos(-s1/2;-s1/2) -ps1/2 cos(p;-s1/2)+s1s2/4 cos(-s2/2,-s1/2).
b^2=s2^2/4 * cos(s2/2;s2/2)-s2p/2 * cos (-p; s2/2) +s2s1/4 * cos (s2/2;s1/2)-ps2/2 * cos(s2/2;-p)+ p^2 * cos(-p;-p) - ps1/2 * cos (-p;s1/2)+s1^2/4 cos(s1/2;s1/2) -ps1/2 cos(-p;s1/2)+s1s2/4 cos(s2/2,s1/2)
c^2=s2^2/4 * cos(-s2/2;-s2/2)-s2p/2 * cos (p; -s2/2) +s2s1/4 * cos (-s2/2;-s1/2)-ps2/2 * cos(-s2/2;p)+ p^2 * cos(p;p) - ps1/2 * cos (p;s1/2)+s1^2/4 cos(-s1/2;-s1/2) -ps1/2 cos(p;-s1/2)+s1s2/4 cos(-s2/2,-s1/2).
d^2=s2^2/4 * cos(-s2/2;-s2/2)+s2p/2 * cos (-p; -s2/2) +s2s1/4 * cos (-s2/2;-s1/2) +ps2/2 * cos(-s2/2;-p)+ p^2 * cos(-p;-p) + ps1/2 * cos (-p;-s1/2)+s1^2/4 cos(-s1/2;-s1/2) +ps1/2 cos(-p;-s1/2)+s1s2/4 cos(-s2/2,-s1/2)

a^2=s2^2 +2s2s1 -2ps2 * cos(-s2/2;p)+ 4p^2+s1^2 -2ps1 cos(p;-s1/2)
b^2=s2^2/4 * cos(s2/2;s2/2)-s2p/2 * cos (-p; s2/2) +s2s1/4 * cos (s2/2;s1/2) -ps2/2 * cos(s2/2;-p)+ p^2 * cos(-p;-p) -ps1/2 * cos (-p;s1/2) +s1^2/4cos(s1/2;s1/2) -ps1/2 cos(-p;s1/2)+s1s2/4 cos(s2/2,s1/2)
c^2=s2^2/4 * cos(-s2/2;-s2/2)-s2p/2 * cos (p; -s2/2) +s2s1/4 * cos (-s2/2;-s1/2) -ps2/2 * cos(-s2/2;p)+ p^2 * cos(p;p) - ps1/2 * cos (p;s1/2)+s1^2/4 cos(-s1/2;-s1/2) -ps1/2 cos(p;-s1/2)+s1s2/4 cos(-s2/2,-s1/2).
d^2=s2^2/4 * cos(-s2/2;-s2/2)+s2p/2 * cos (-p; -s2/2) +s2s1/4 * cos (-s2/2;-s1/2) +ps2/2 * cos(-s2/2;-p)+ p^2 * cos(-p;-p) +ps1/2 * cos (-p;-s1/2) +s1^2/4cos(-s1/2;-s1/2) +ps1/2 cos(-p;-s1/2)+s1s2/4 cos(-s2/2,-s1/2)

a^2=(-s2/2+p+s1/2)^2=
=s2^2/4 + p^2 + s1^2/4
-(s2,p) +(s1,p)-0.5(s1,s2)

b^2=(s2/2-p+s1/2)^2=
=s2^2/4 + p^2 + s1^2/4
- (s2,p)+0.5(s1,s2)-(p, s1)

c^2=(s2/2+p-s1/2)^2=
s2^2/4 + p^2 + s1^2/4
+(s2,p) -(s1,p)-0.5(s1,s2)

d^2=(-s1/2-p-s2/2)^2=
s2^2/4 + p^2 + s1^2/4
+(s2,p) +(s1,p)+0.5(s1,s2)
a^2+b^2+
c^2+d^2=s2^2+4p^2+s1^2