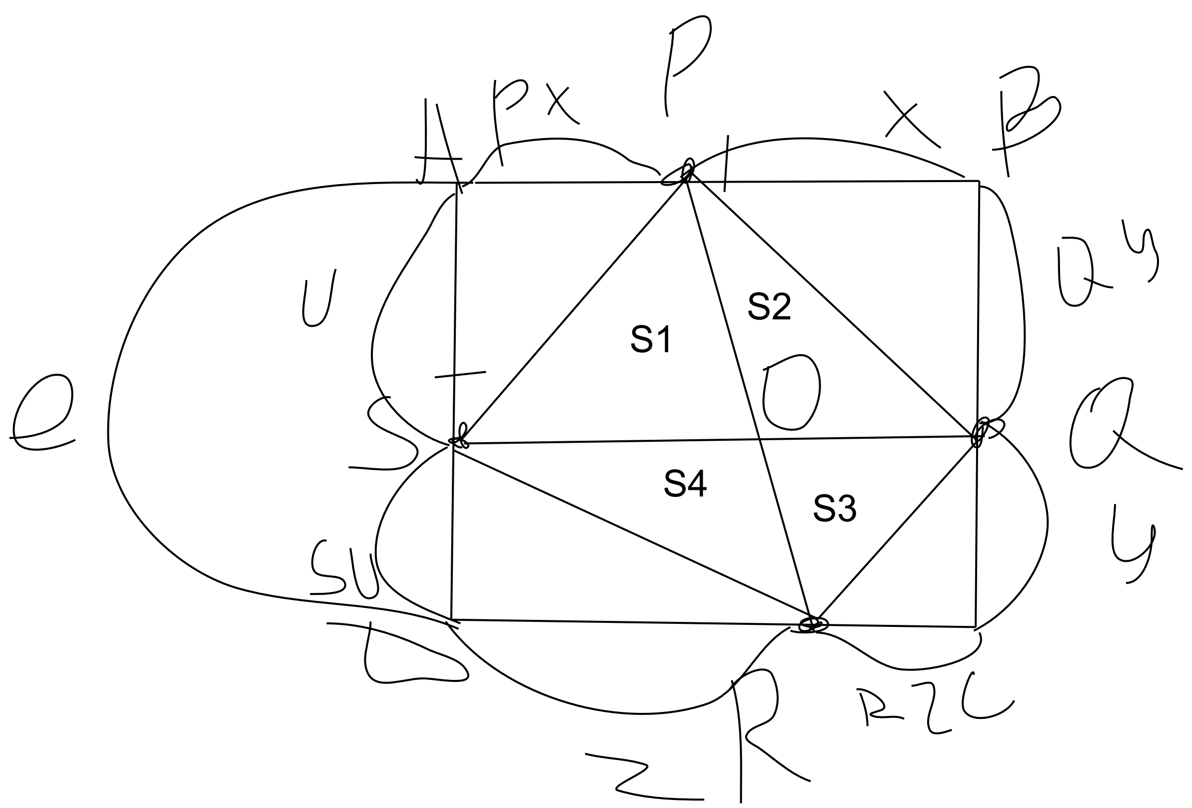
Дан квадрат ABCD.На сторонах AB,BC,CD и AD соответственно выбраны точки P,Q,R,S таким образом, что AP/PB=p, BQ/QC=q, CR/RD=r, DS/SA=S. Отрезки PR и QS пересекаются в точке O. Найти PO/OR.



tip01 достроить отрезки SP,PQ,QR,RS

tip02 обозначим S1=S(SOP),S2=S(POQ), S3=S(SDR),S4=S(PQC)

tip03 нетрудно найти доли в общей площади квадрата S0 S1+S2,S2+S3,S3+S4,S4+S1

tip04 зная S2 и S3 - ты сможешь найти PO/OR

1*t+1*k+0*g+0*n=a
0*t+1*k+1*g+0*n=b
0*t+0*k+1*g+1*n=c
1*t+0*k+0*g+1*n=d

1*t+1*k+0*g+0*n=a
0*t+1*k+1*g+0*n=b
0*t+0*k+1*g+1*n=c
0*t+-1*k+0*g+1*n=d-a

1*t+1*k+0*g+0*n=a
0*t+1*k+1*g+0*n=b
0*t+0*k+1*g+1*n=c
0*t+0*k+1*g+1*n=d-a+b

AP/PB=p
BQ/QC=q
CR/RD=r
DS/SA=s

px+x=qy+y=rz+z=sv+v=e
x=e/(p+1)
y=e/(q+1)
z=e/(r+1)
v=e/(s+1)

S(ASQB)=(qy+v)e/2
S(ASP)=px*v/2
S(PBQ)=x*qy/2
S1+S2=(qy+v)e/2-px*v/2-x*qy/2=
=[(qe/(q+1)+e/(s+1))e-pe/(p+1)*e/(s+1)-e/(p+1)*qe/(q+1)]/2=
=[qe^2/(q+1)+e^2/(s+1)-pe^2/((p+1)(s+1))-e^2q/((p+1)(q+1))]/2==e^
2[q/(q+1)+1/(s+1)-p/((p+1)(s+1))-q/(p+1)(q+1)]/2=
=e^2[q/(q+1)+1/(s+1)-p/((p+1)(s+1))-q/(p+1)(q+1)]/2=e^2W

S(PBCR)=(rz+x)e/2
S(RQC)=rzy/2
S(PBQ)=qyx/2
S2+S3=(rz+x)e/2-rzy/2-qyx/2=
=[(rz+x)e-rzy-qyx]/2=[erz+ex-rzy-qyx]/2=
=[re^2/(r+1)+e^2/(p+1)-re^2/((r+1)(q+1))-qe^2/((q+1)(p+1))]/2=
=e^2[r/(r+1)+1/(p+1)-r/((r+1)(q+1))-q/((q+1)(p+1))]/2=e^2F

S3+S4=(su+y)e/2-svz/2-rzy/2=
=e^2[s/(s+1)+1/(q+1)-s/((s+1)(r+1))-r/((r+1)(q+1))]/2=e^2J

S4+S1=e^2[p/(p+1)+1/(r+1)-p/((p+1)(s+1))-s/((s+1)(p+1))]/2==e^2H

S1+S2=e^2W=a
S2+S3=e^2F=b
S3+S4=e^2J=c
S4+S1=e^2H=d
S1=t
S2=k
S3=g
S4=n

t+k=a
k+g=b
g+n=c
n+t=d

k=a-t
a-t+g=b
g+n=c
n+t=d

k=a-t
g=b-a+t
(b-a+t)+n=c
n+t=d

k=a-t
g=b-a+t
n=c-b+a-t
(c-b+a-t)+-t=d

k=a-t
g=b-a+t
n=c-b-t
2t=-d+c-b+a

k=a-t
g=b-a+t
n=c-b+a-t
t=-d/2+a/2+c/2-b/2

1	1	0	0	a|*(-1) ->4
0	1	1	0	b
0	0	1	1	c
1	0	0	1	d

1	1	0	0	a
0	1	1	0	b|*(-1) -> 1; *1 ->4
0	0	1	1	c
0	-1	0	1	d-a

1	0	-1	0	a-b
0	1	1	0	b
0	0	1	1	c|*1->1 ; *(-1)->2; *(-1)->4
0	0	1	1	d-a+b

1	0	0	1	a-b+c
0	1	0	1	b+c
0	0	1	1	c
0	0	0	0	d-a+b-c

1	0	0	0	?1
0	1	0	0	?2
0	0	1	0	?3
0	0	0	1	?4

k=a-(a/2+c/2-d/2-b/2)
g=b-a+a/2+c/2-d/2-b/2
n=c-b+a-(a/2+c/2-d/2-b/2)
t=a/2+c/2-d/2-b/2

k=[a-c+d+b]/2
g=[-a+c-d+b]/2
n=[a+c+d-b]/2
t=[a+c-d-b]/2

k=[a-c+d+b]/2=e^2[W-J+H+F]/2=S2
g=[-a+c-d+b]/2=e^2[-W+J-H+F]/2=S3
n=[a+c+d-b]/2=e^2[W+J+H-F]/2=S4
t=[a+c-d-b]/2=e^2[W+J-H-F]/2=S1
PO/OR=S2/S3=
=e^2[W-J+H+F]/e^2[-W+J-H+F]=
=[W-J+H+F]/[-W+J-H+F]