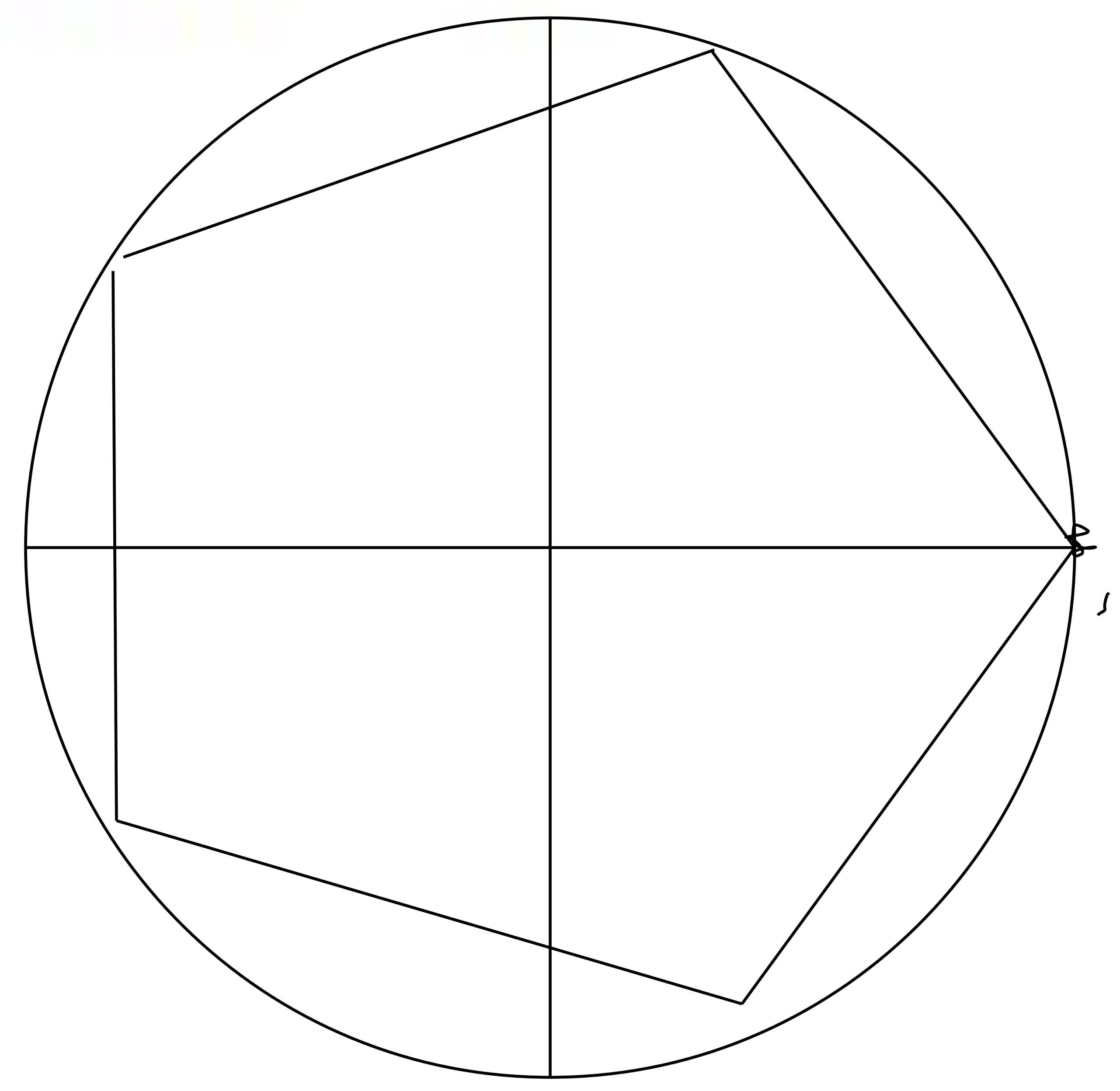
**7.29.** Найдите сумму степеней порядка $s$ всех корней уравнения $z^n = 1$, где $s$ — целое число.



z=cosa+isina
z^n=1
cosan+isinan=1=|1|(cosb+isinb)=cosb+isinb
b=0

an=b+2Pk
a=(b+2Pk)/n

z_k=cosa+isina=cos[(b+2Pk)/n]+isin[(b+2Pk)/n]=
=cos[(2Pk)/n]+isin[(2Pk)/n]

z_k^s=cos[(s2Pk)/n]+isin[(s2Pk)/n]

7.32-7.35

если s кратно n, ----------n
то cos[(s2Pk)/n]=1,sin[(s2Pk)/n]=0
сумма равна n

если s не кратно n --------0
n=5
z_1^s+z_2^s+z_3^s+z_4^s+z_5^s=cos0+isin0+cos(s2P/5)+sin(s2P/5)+cos(s4P/5)+i*sin(s4P/5)+cos(s6P/5)+
+i*sin(s6P/5)+cos(s8P/5)+i*sin(s8P/5)=cos0+cos(s2P/5)+cos(s4P/5)+cos(s6P/5)+cos(s8P/5)+
+i*(sin0+sin(s2P/5)+sin(s4P/5)++sin(s6P/5)+sin(s8P/5))
**cosx+cos2x+...+cos(n-1)x+cosnx=sin(nx/2)*cos(x(n+1)/2)/sin(x/2)**
cos(s2P/5)+cos(s4P/5)+cos(s6P/5)+cos(s8P/5)+cos(10Ps/5)=**sin(5s2P/5*2)*cos(s2P6/5*2)/sin(2Ps/5*2)=0**
**x=2Ps/5**
**cosx+cos2x+...+cos(n-1)x+cosnx=sin(nx/2)*cos(x(n+1)/2)/sin(x/2)**

**sinx+sin2x+...+sin(n-1)x+sinnx=sin(nx/2)*sin(x(n+1)/2)/sin(x/2)**
(sin(s2P/5)+sin(s4P/5)++sin(s6P/5)+sin(s8P/5)+sin(10P/5))=0+**sin(Ps)*sin(x(n+1)/2)/sin(x/2)=0**