$\sin^5 x + \cos^5 x = 1$

1 попытка

$((1-\cos 2x)/2)(3\sin x-\sin 3x)/4+((1+\cos 2x)/2)(3\cos x+\cos 3x)/4=1$

$3\sin x-3\cos 2x\sin x-1\sin 3x+1\cos 2x\sin 3x+3\cos x+3\cos 2x\cos x+\cos 3x+\cos 2x\cos 3x=8$

2 способ

$\sin^5 x + \cos^5 x = \sin^2 x + \cos^2 x$

$\sin^5 x-\sin^2 x=\cos^2 x-\cos^5 x$

$\sin^2 x(\sin^3 x-1)=\cos^2 x(1-\cos^3 x)$

$a^3-b^3=(a-b)(a^2+ab+b^2)$

$\sin^2 x((\sin x-1)(\sin^2 x+\sin x+1))=\cos^2 x(1-\cos x)(\cos^2 x+\cos x+1))$

$(1-\cos^2 x)((\sin x-1)(\sin^2 x+\sin x+1))=(1-\sin^2 x)(1-\cos x)(\cos^2 x+\cos x+1))$

$((1-\cos x)(1+\cos x))((\sin x-1)(\sin^2 x+\sin x+1))=((1-\sin x)(1+\sin x))(1-\cos x)(\cos^2 x+\cos x+1))$

$((1-\cos x)(1+\cos x))((\sin x-1)(\sin^2 x+\sin x+1))+((\sin x-1)(1+\sin x))(1-\cos x)(\cos^2 x+\cos x+1))=0$

$((1-\cos x)(\sin x-1)) \quad ((1+\cos x)(\sin^2 x+\sin x+1) + (1+\sin x)(\cos^2 x+\cos x+1))=0$

$(1-\cos x)(\sin x-1)=0$

$1-\cos x=0$

$\cos x=1$

$x=2pk$

$\sin x=1$

$x=p/2+2pk$

$(1+\cos x)(\sin^2 x+\sin x+1) + (1+\sin x)(\cos^2 x+\cos x+1)=0$

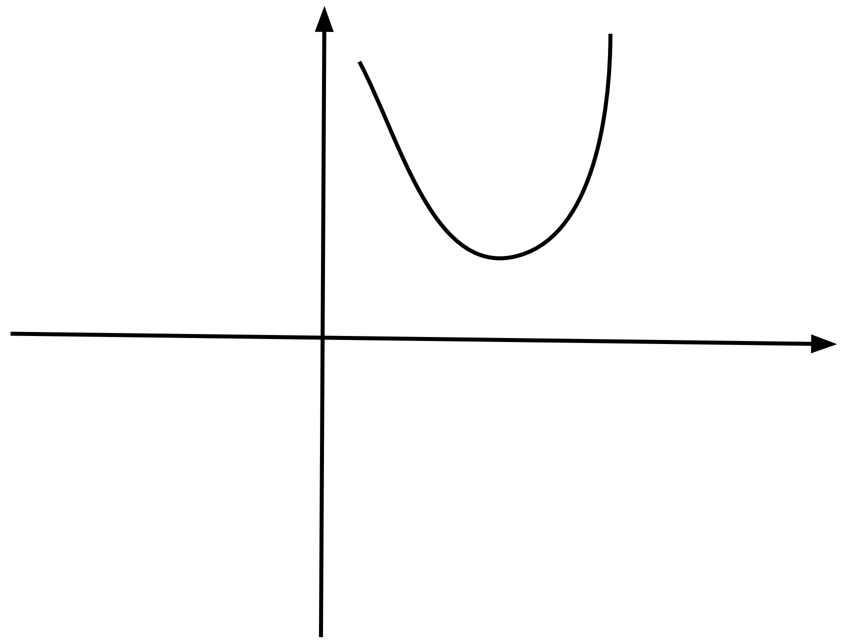
$f(x)=\sin^2 x+\sin x+1 \quad f(x)>0 \qquad g(x)=\cos^2 x+\cos x+1>0$

$\sin x=t$

$f(t)=t^2+t+1$

$D=1-4=-3$

Ответ: $2pk$; $p/2+2pk$;



$1+\cos x>0$

$\cos x>-1$

$1+\sin x<0$

$\sin x<-1$ - не бывает