WZORY REDUKCYJNE

ćwiartka **II**

$\beta \in$ **(90°;180°)**

ćwiartka **I**

$\beta \in$ **(0°;90°)**

y

x

sin (180°-α) =sin α	sin (90°+α) = cos α
cos (180°-α) = −cos α	cos (90°+α) = −sin α
tg (180°-α) = −tg α	tg (90°+α) = −ctg α
ctg (180°-α) = −ctg α	ctg (90°+α) = −tg α

sin (90°-α) =cos α
cos (90°-α) =sin α
tg(90°-α) =ctg α
ctg(90°-α) =tg α

sin (180°+α) = −sin α	sin (270°-α) = −cos α
cos (180°+α) = −cos α	cos (270°-α) = −sin α
tg (180°+α) = tg α	tg (270°-α) = ctg α
ctg (180°+α) = ctg α	ctg (270°-α) = tg α

sin (270°+α) = −cos α	sin (360°-α) = −sin α
cos (270°+α) = sin α	cos (360°-α) = cos α
tg (270°+α) = −ctg α	tg (360°-α) = −tg α
ctg (270°+α) = −tg α	ctg (360°-α) = - ctg α

ćwiartka **III**

$\beta \in$ **(180°;270°)**

ćwiartka **IV**

$\beta \in$ **(270°;360°)**

Wzory redukcyjne $\alpha\in(0^\circ;90^\circ)$

	I ćwiartka	II ćwiartka		III ćwiartka		IV ćwiartka	
β	$\frac{\pi}{2}-\alpha$	$\frac{\pi}{2}+\alpha$	$\pi-\alpha$	$\pi+\alpha$	$\frac{3}{2}\pi-\alpha$	$\frac{3}{2}\pi+\alpha$	$2\pi-\alpha$
	90°-α	90°+α	180°-α	180°+α	270°-α	270°+α	360°-α
$\sin\beta$	$\cos\alpha$	$\cos\alpha$	$\sin\alpha$	$-\sin\alpha$	$-\cos\alpha$	$-\cos\alpha$	$-\sin\alpha$
$\cos\beta$	$\sin\alpha$	$-\sin\alpha$	$-\cos\alpha$	$-\cos\alpha$	$-\sin\alpha$	$\sin\alpha$	$\cos\alpha$
$\operatorname{tg}\beta$	$\operatorname{ctg}\alpha$	$-\operatorname{ctg}\alpha$	$-\operatorname{tg}\alpha$	$\operatorname{tg}\alpha$	$\operatorname{ctg}\alpha$	$-\operatorname{ctg}\alpha$	$-\operatorname{tg}\alpha$
$\operatorname{ctg}\beta$	$\operatorname{tg}\alpha$	$-\operatorname{tg}\alpha$	$-\operatorname{ctg}\alpha$	$\operatorname{ctg}\alpha$	$\operatorname{tg}\alpha$	$-\operatorname{tg}\alpha$	$-\operatorname{ctg}\alpha$