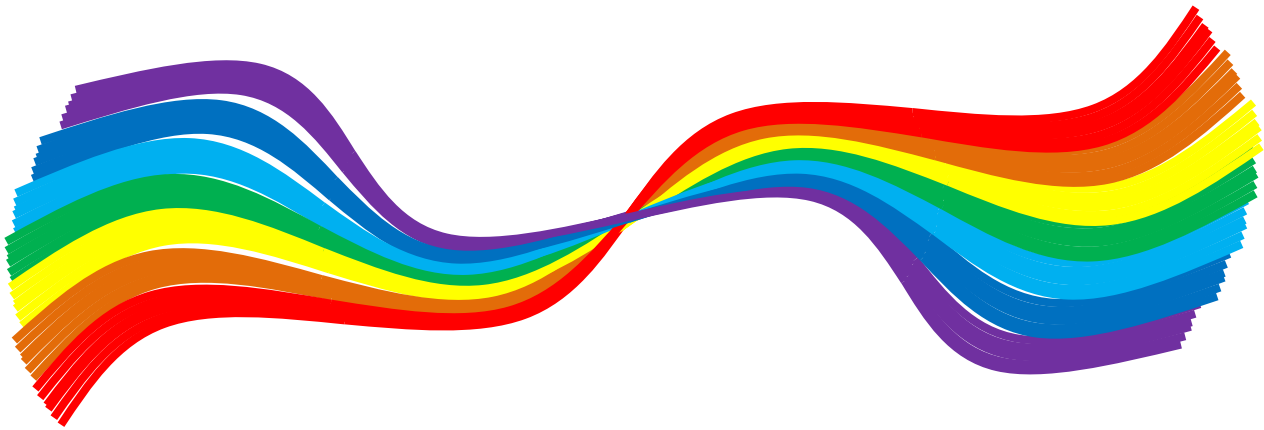
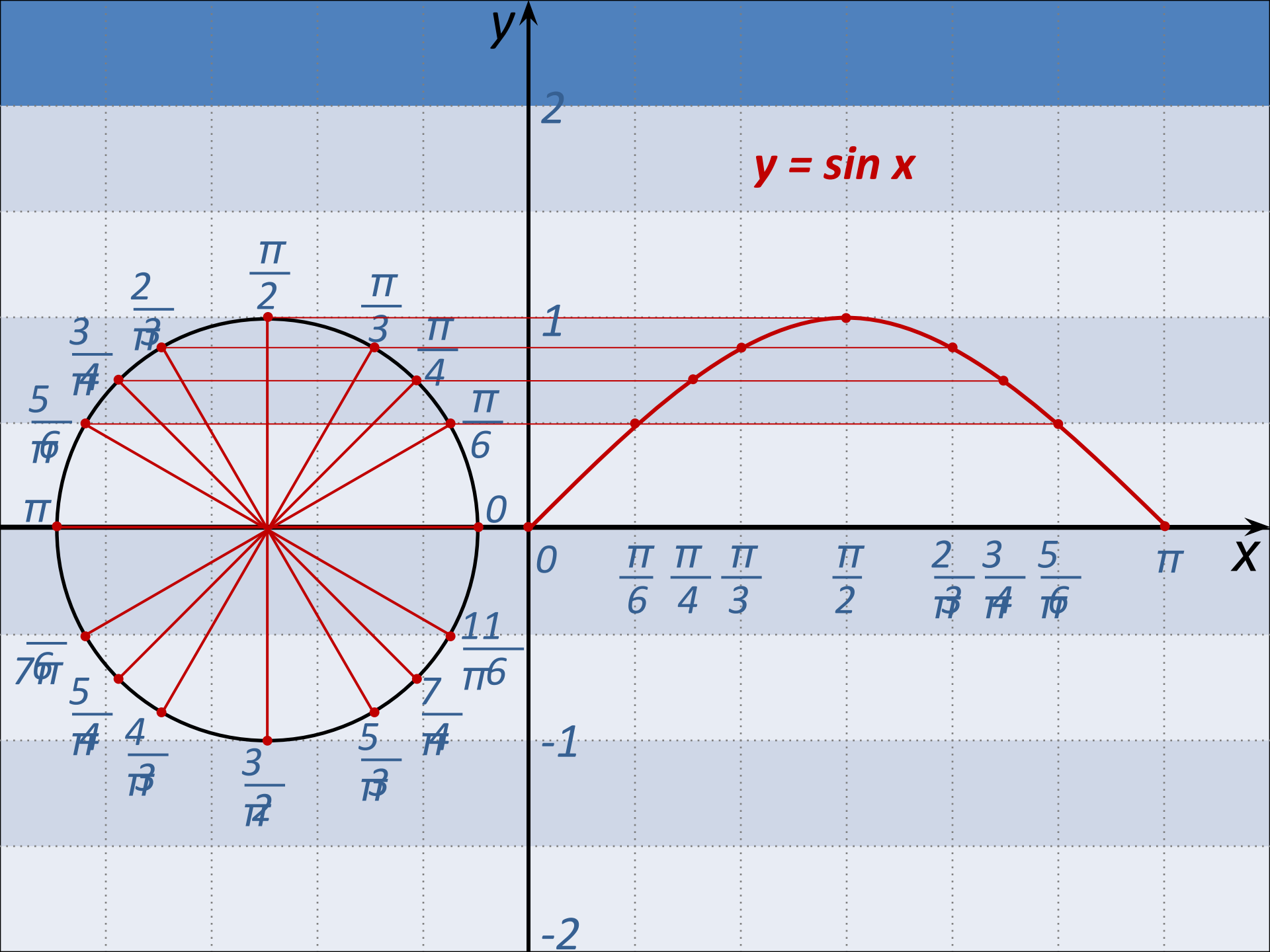
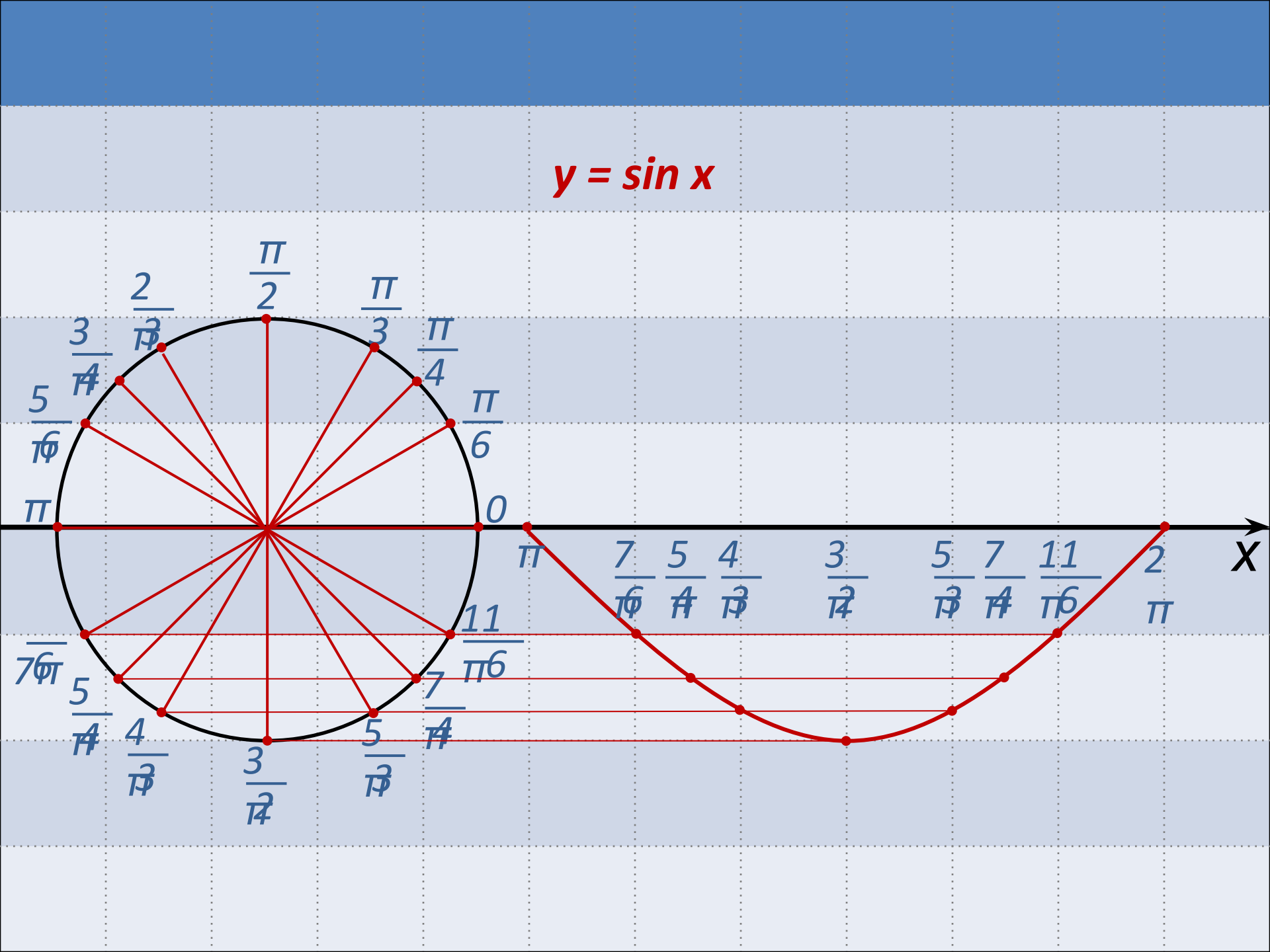
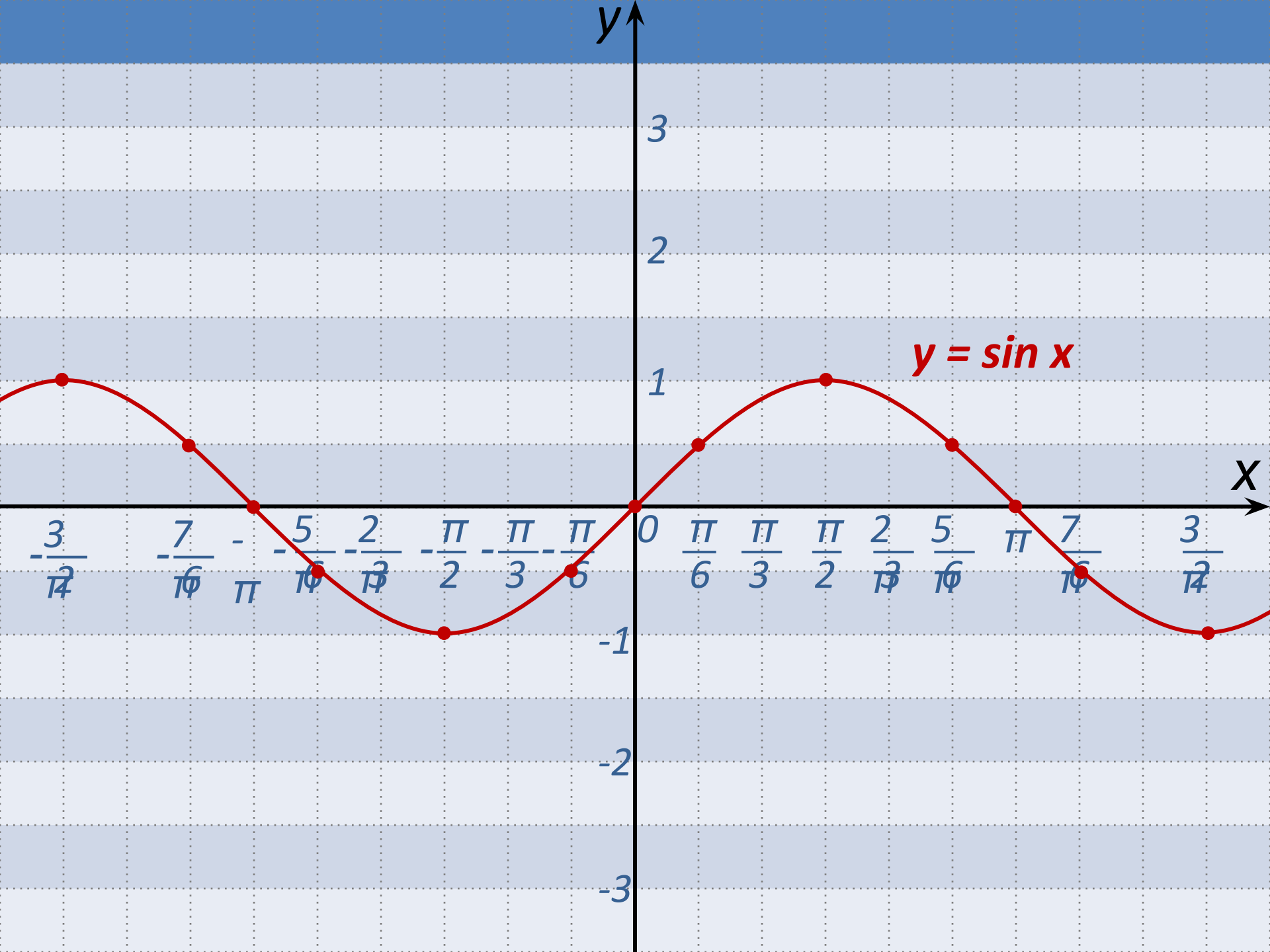
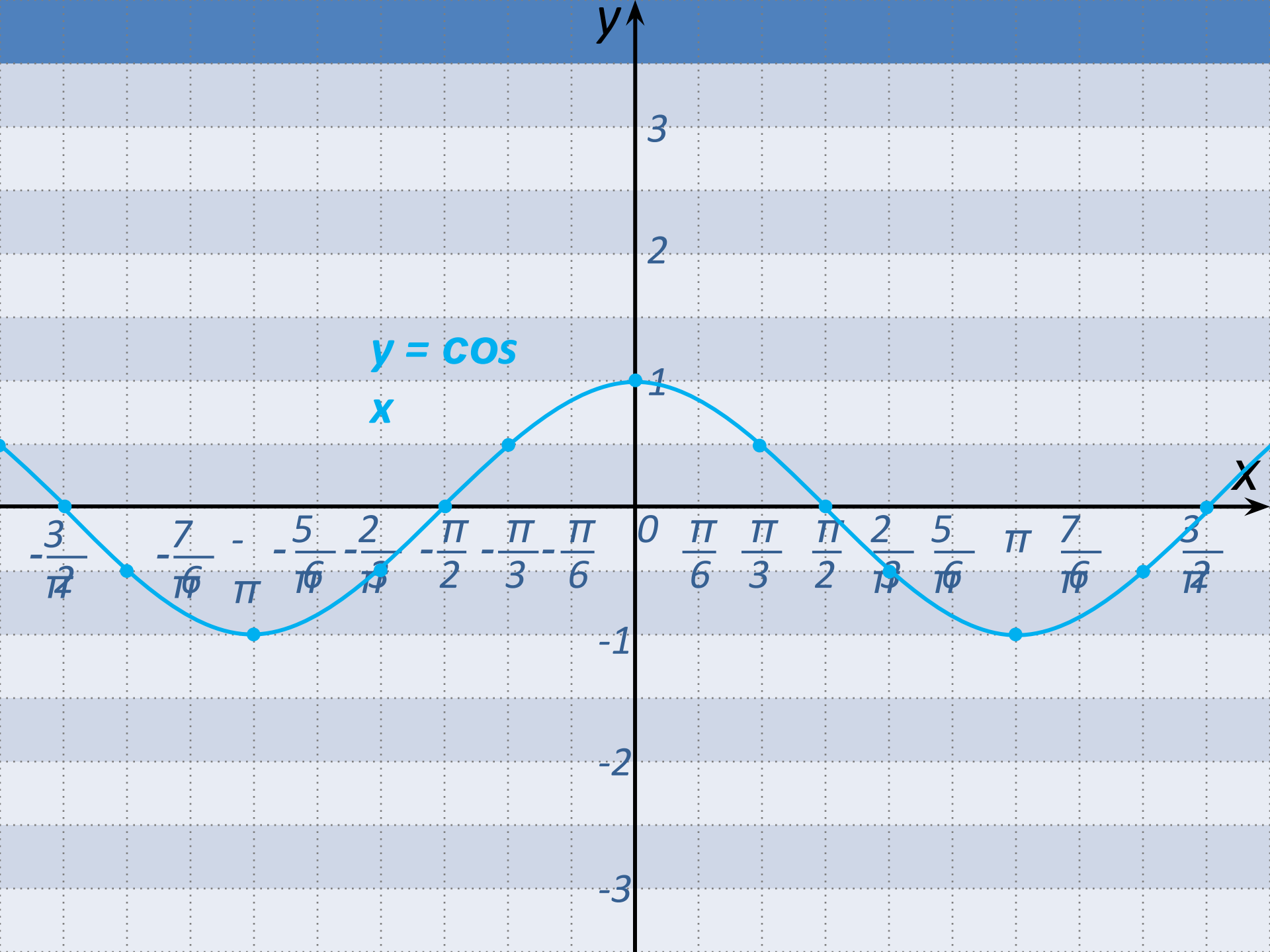
Построение графиков тригонометрических функций

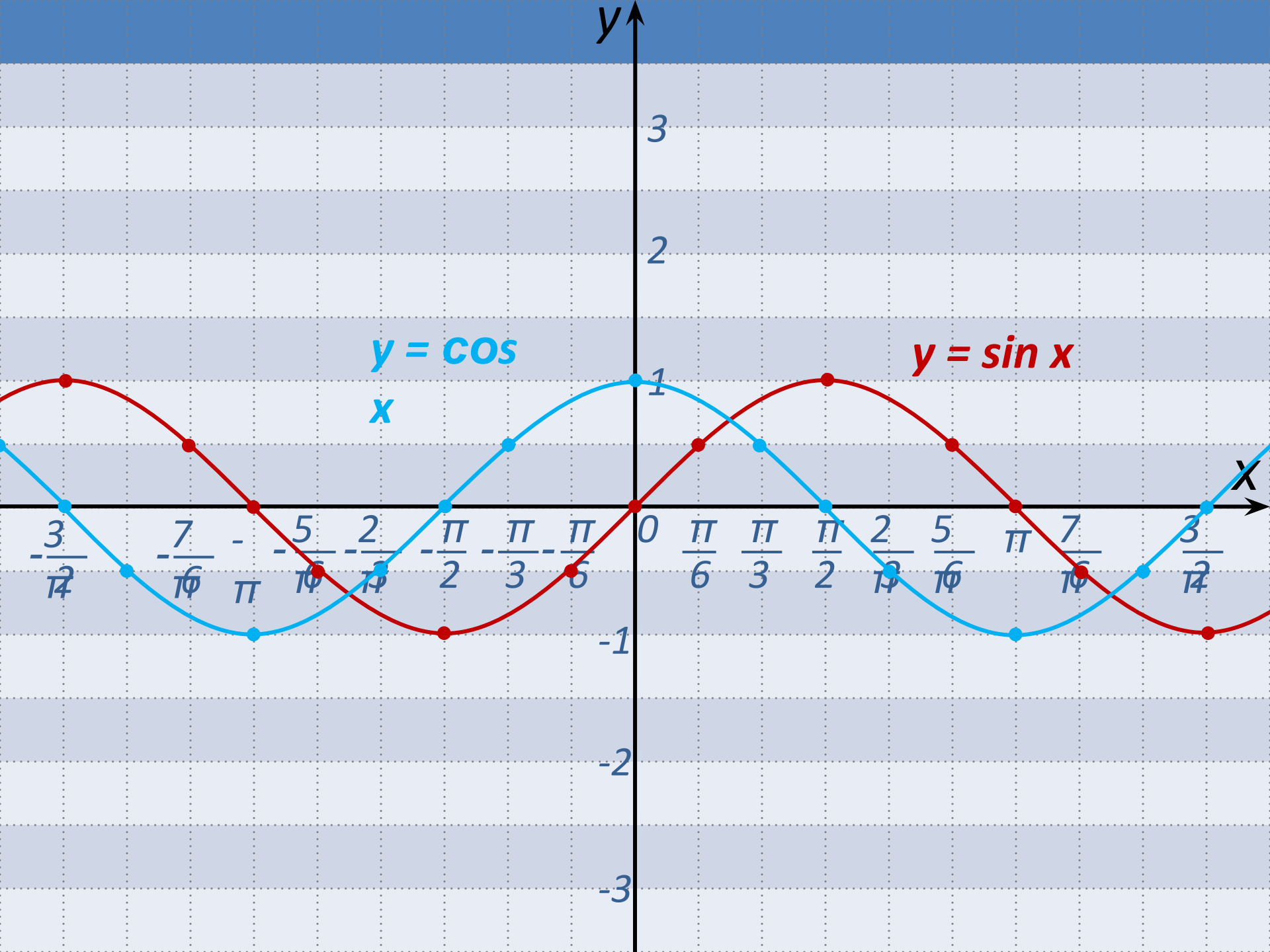



y
x
2
1
-1
-2
y = sin x
0
π/6
π/4
π/3
π/2
2π/3
3π/4
5π/6
π
7π/6
5π/4
4π/3
3π/2
5π/3
7π/4
11π/6


y = sin x
π/2
2π/3
π/3
3π/4
π/4
5π/6
π/6
π
0
7π/6
11π/6
5π/4
7π/4
4π/3
5π/3
3π/2
x
2π


y
x
3
2
1
-1
-2
-3
y = sin x
-3π/2
-7π/6
-π
-5π/6
-2π/3
-π/2
-π/3
-π/6
0
π/6
π/3
π/2
2π/3
5π/6
π
7π/6
3π/2

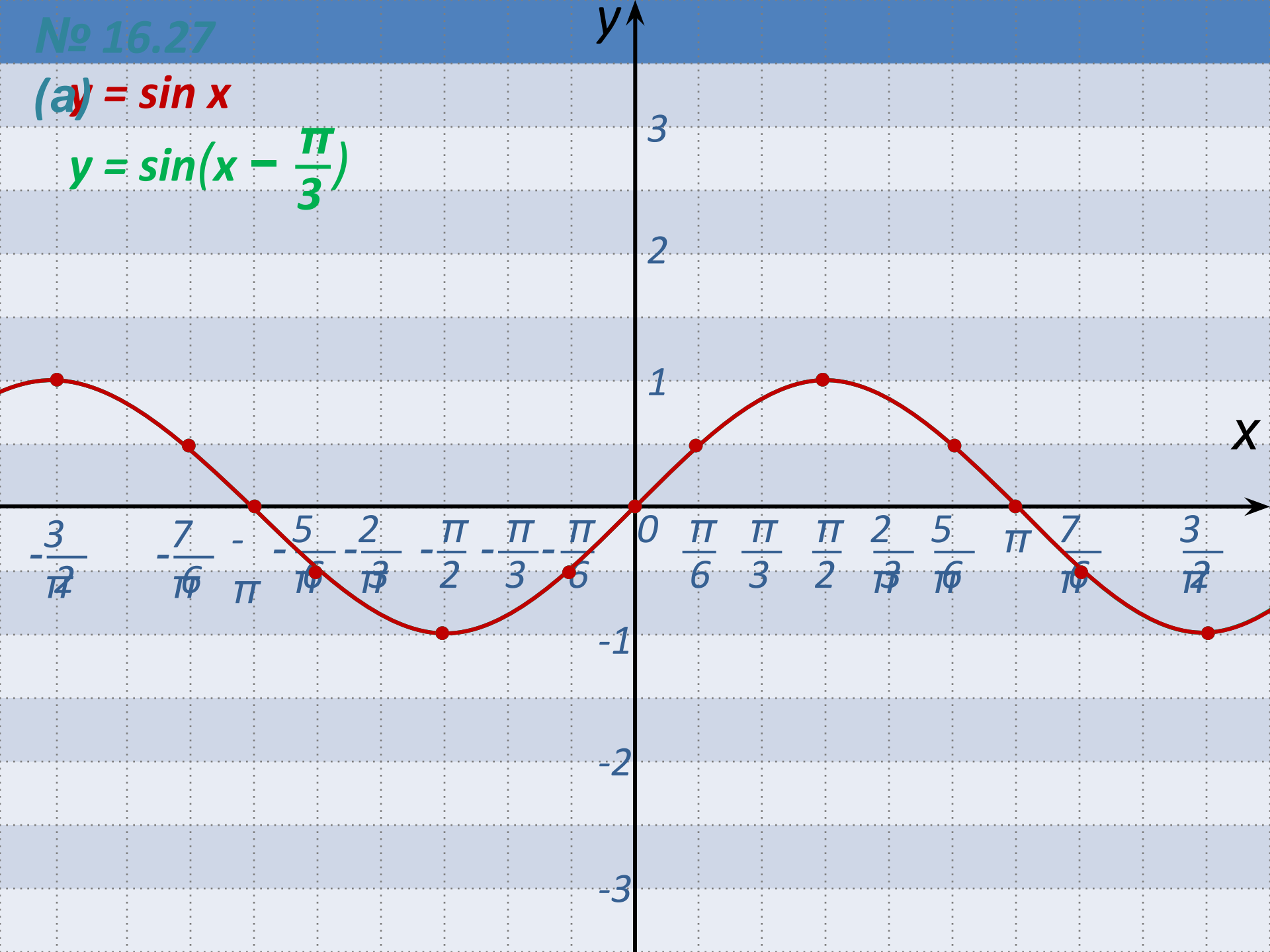

y
x
y = cos
x
3
2
1
-1
-2
-3
0
π
π/2
π/3
π/6
2π/3
5π/6
7π/6
3π/2
-π
-3π/2
-5π/6
-2π/3
-π/2
-π/3
-π/6


y
x
3
2
1
-1
-2
-3
y = cos x
y = sin x
0
π/6
π/3
π/2
2π/3
5π/6
π
7π/6
3π/2
-π/6
-π/3
-π/2
-2π/3
-5π/6
-π
-7π/6
-3π/2

№ 16.27

(а) $y = \sin x$

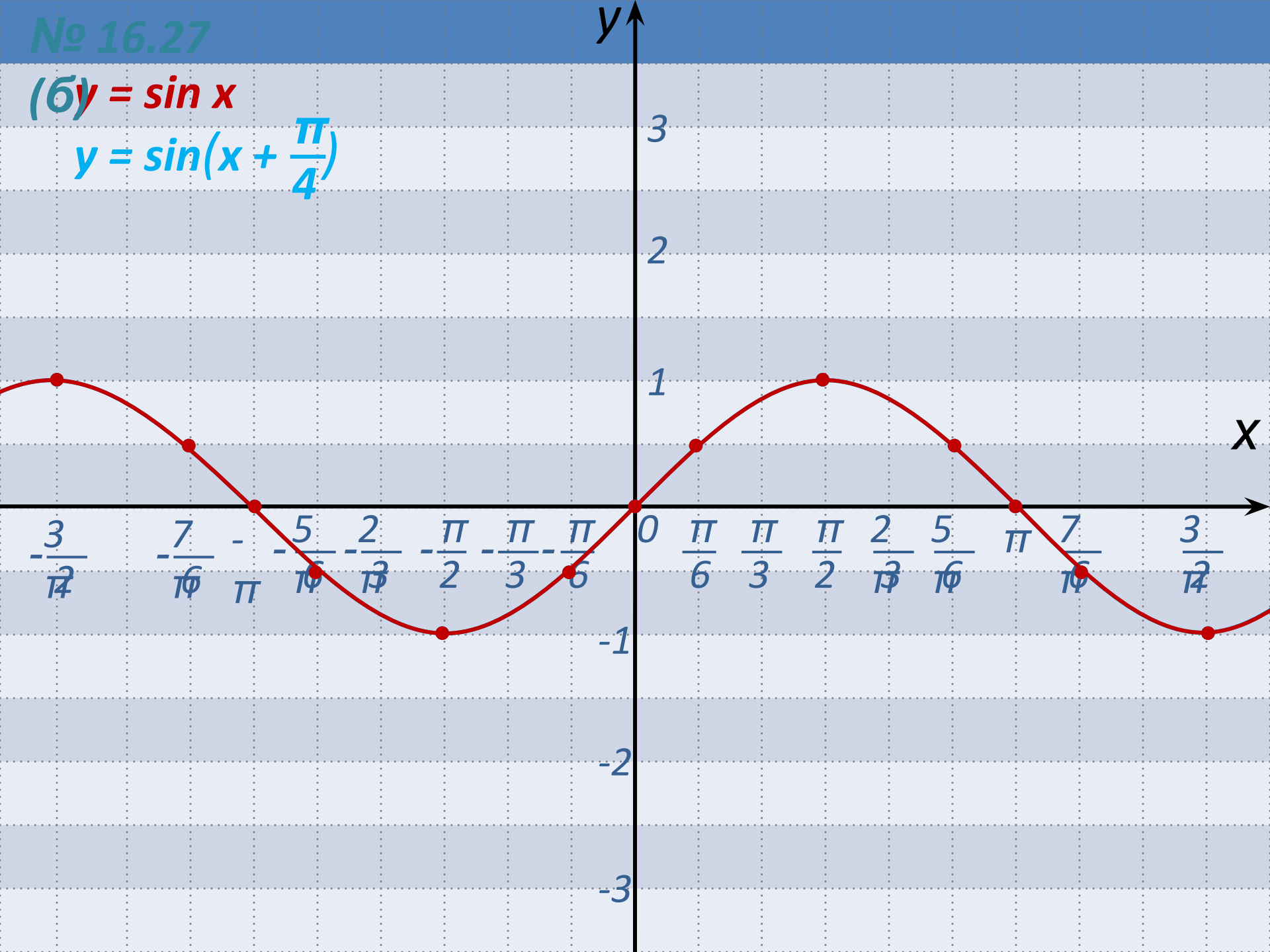
$y = \sin\left(x - \frac{\pi}{3}\right)$



№ 16.27

(б) $y = \sin x$

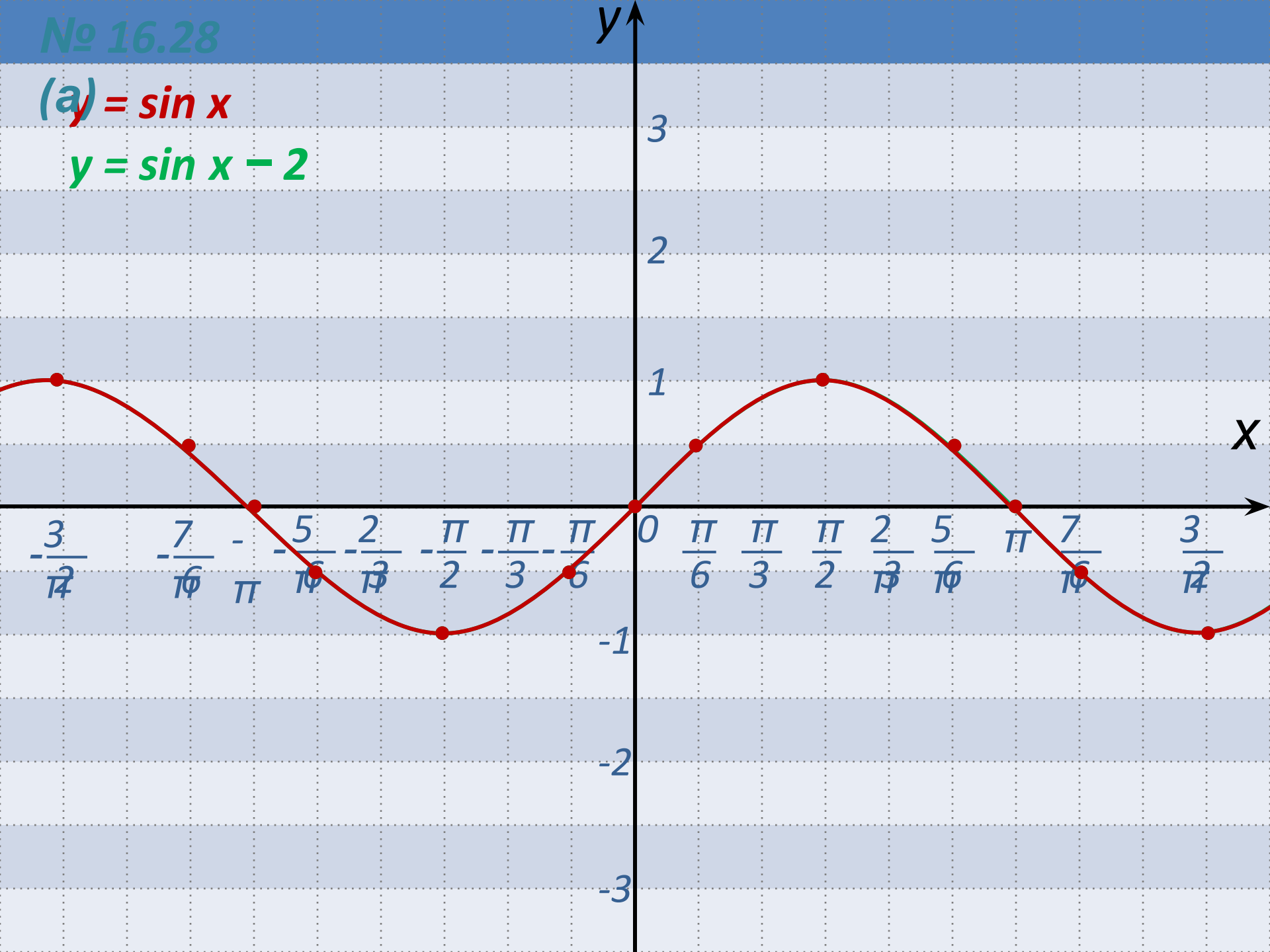
$y = \sin\left(x + \frac{\pi}{4}\right)$



№ 16.28

(а) $y = \sin x$

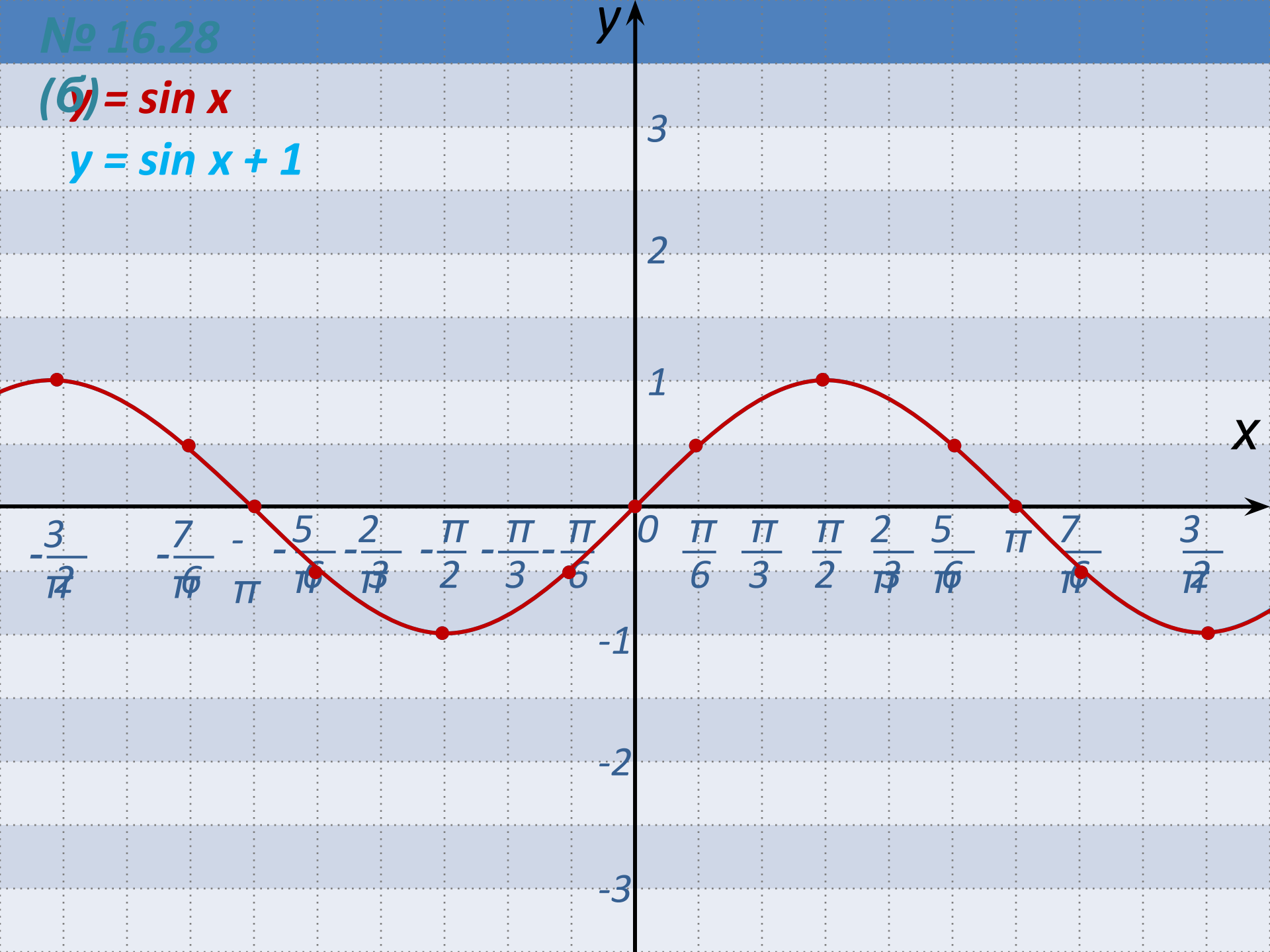
$y = \sin x - 2$



№ 16.28

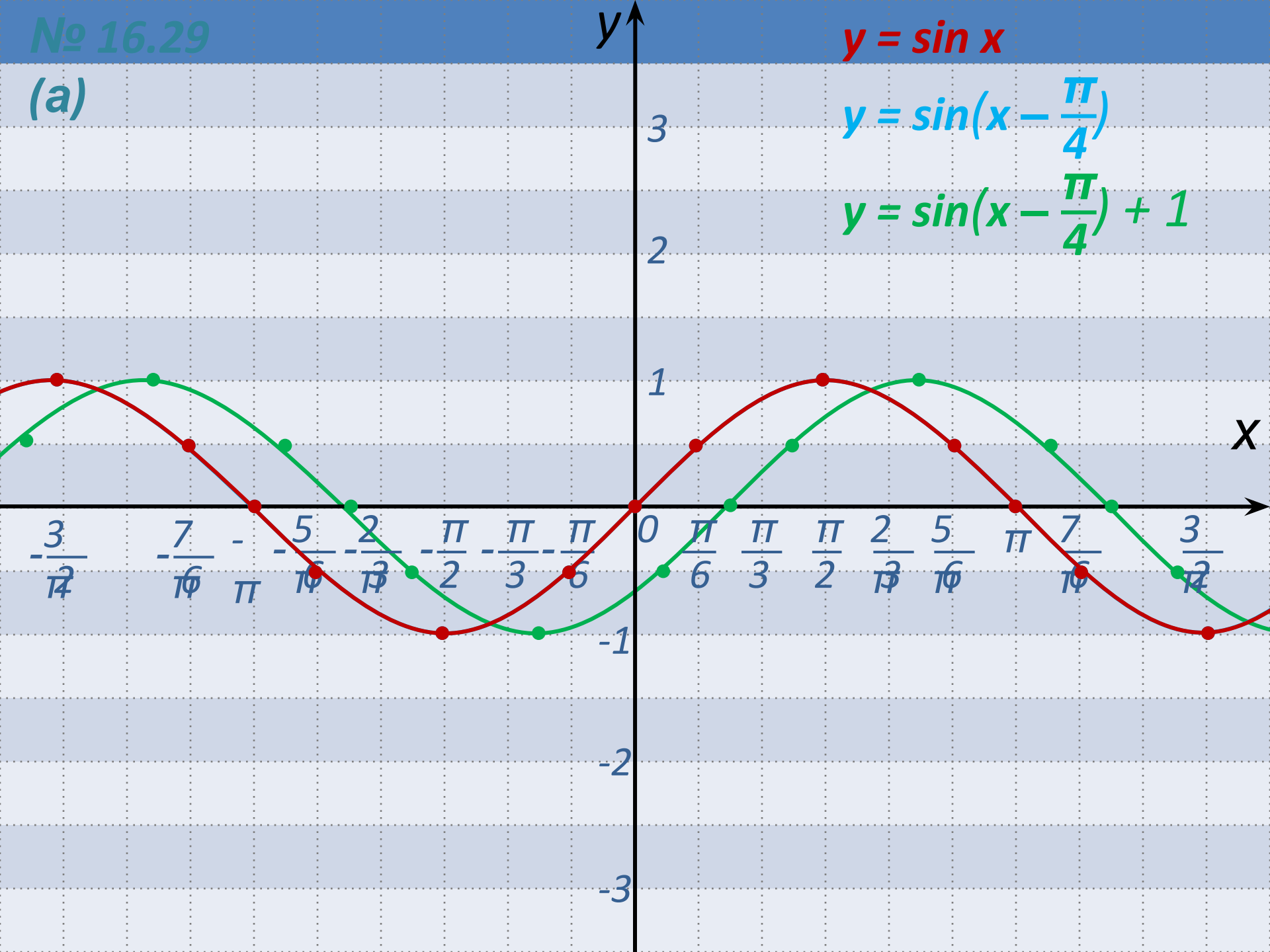
(б) $y = \sin x$

$y = \sin x + 1$



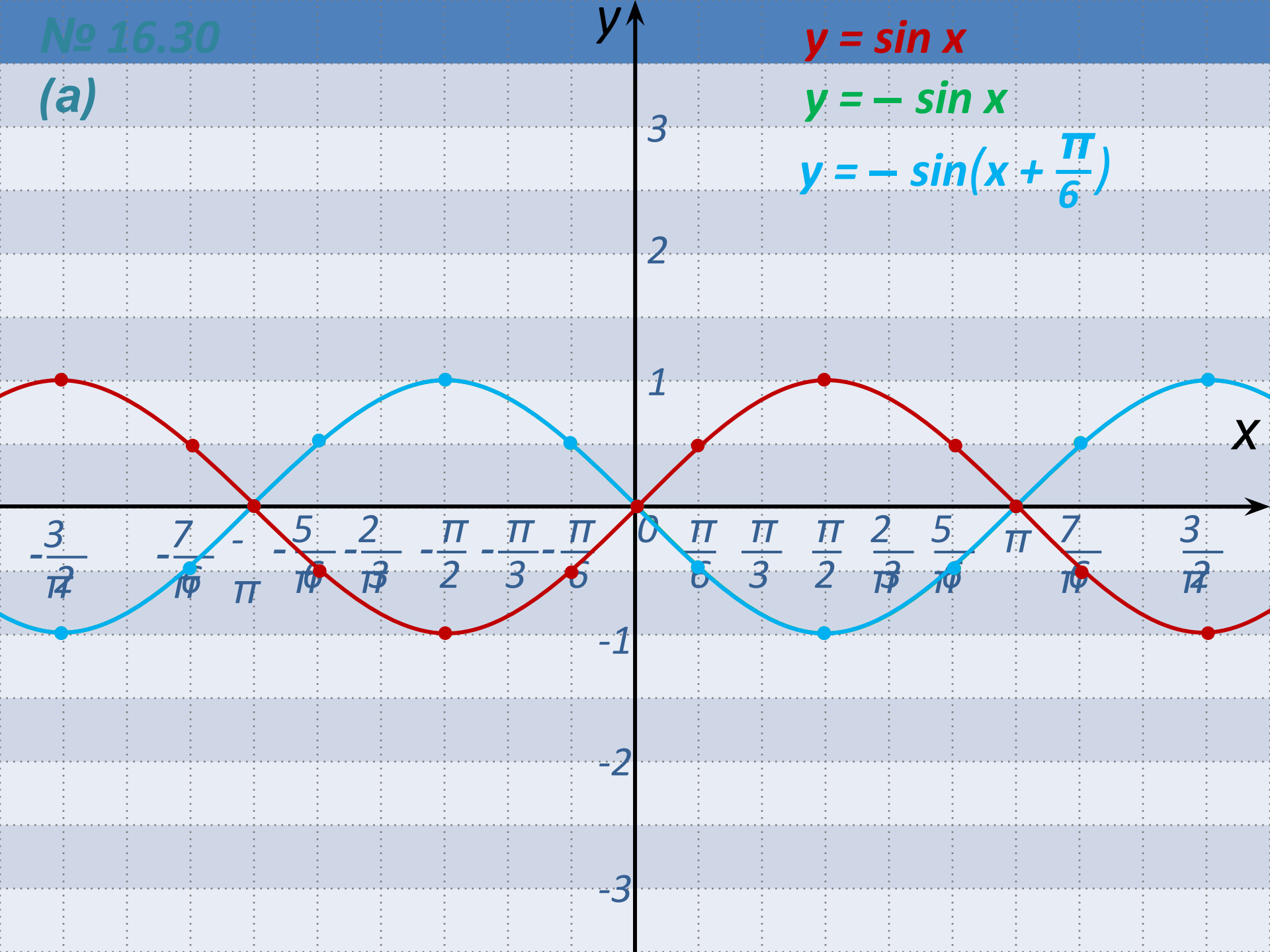
№ 16.29

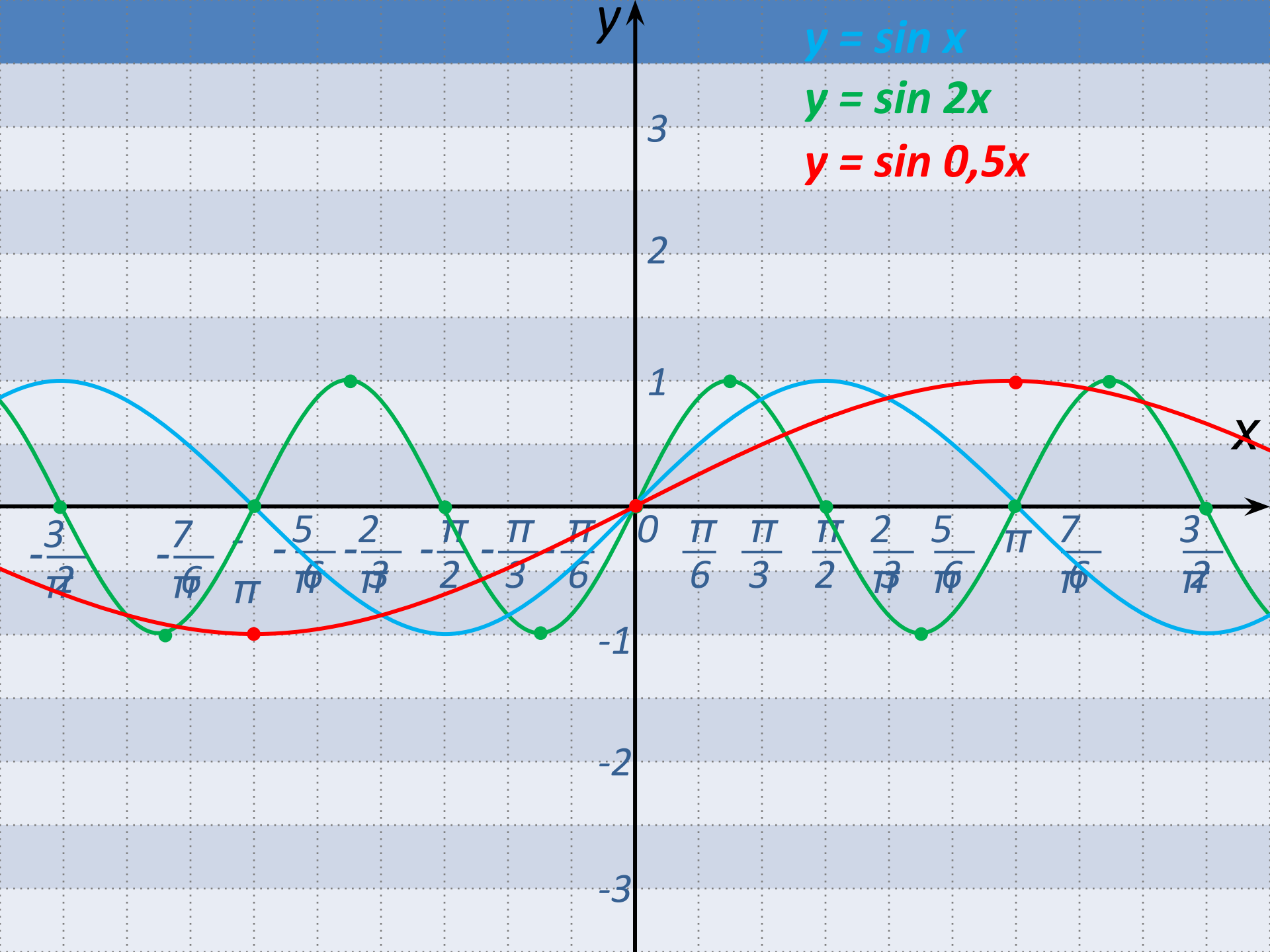
(a)

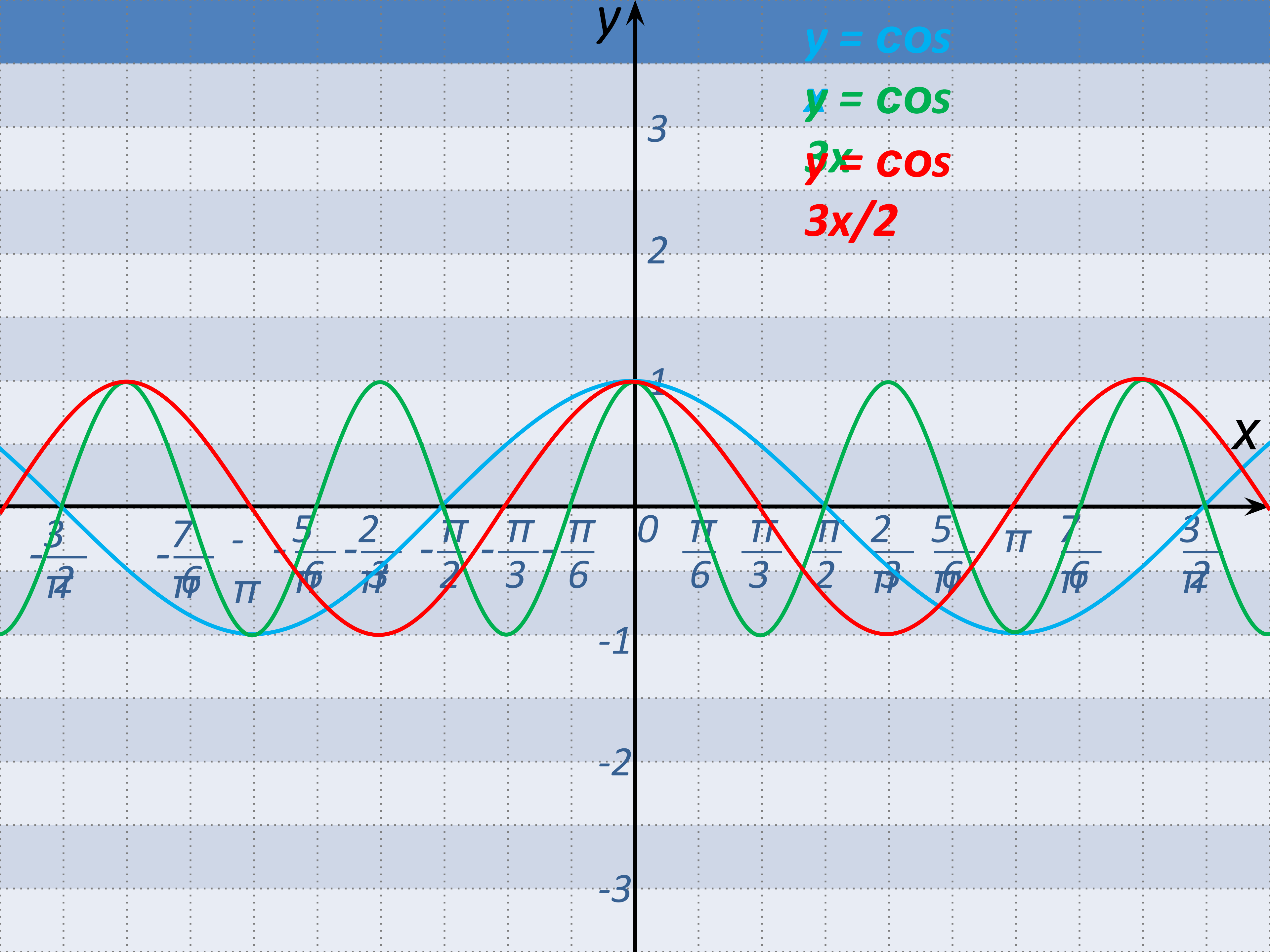

y
x
y = sin x
y = sin(x − π/4)
y = sin(x − π/4) + 1
3
2
1
-1
-2
-3
-3π/4
-7π/6
-π
-5π/6
-2π/3
-π/2
-π/3
-π/6
0
π/6
π/3
π/2
2π/3
5π/6
π
7π/6
3π/2

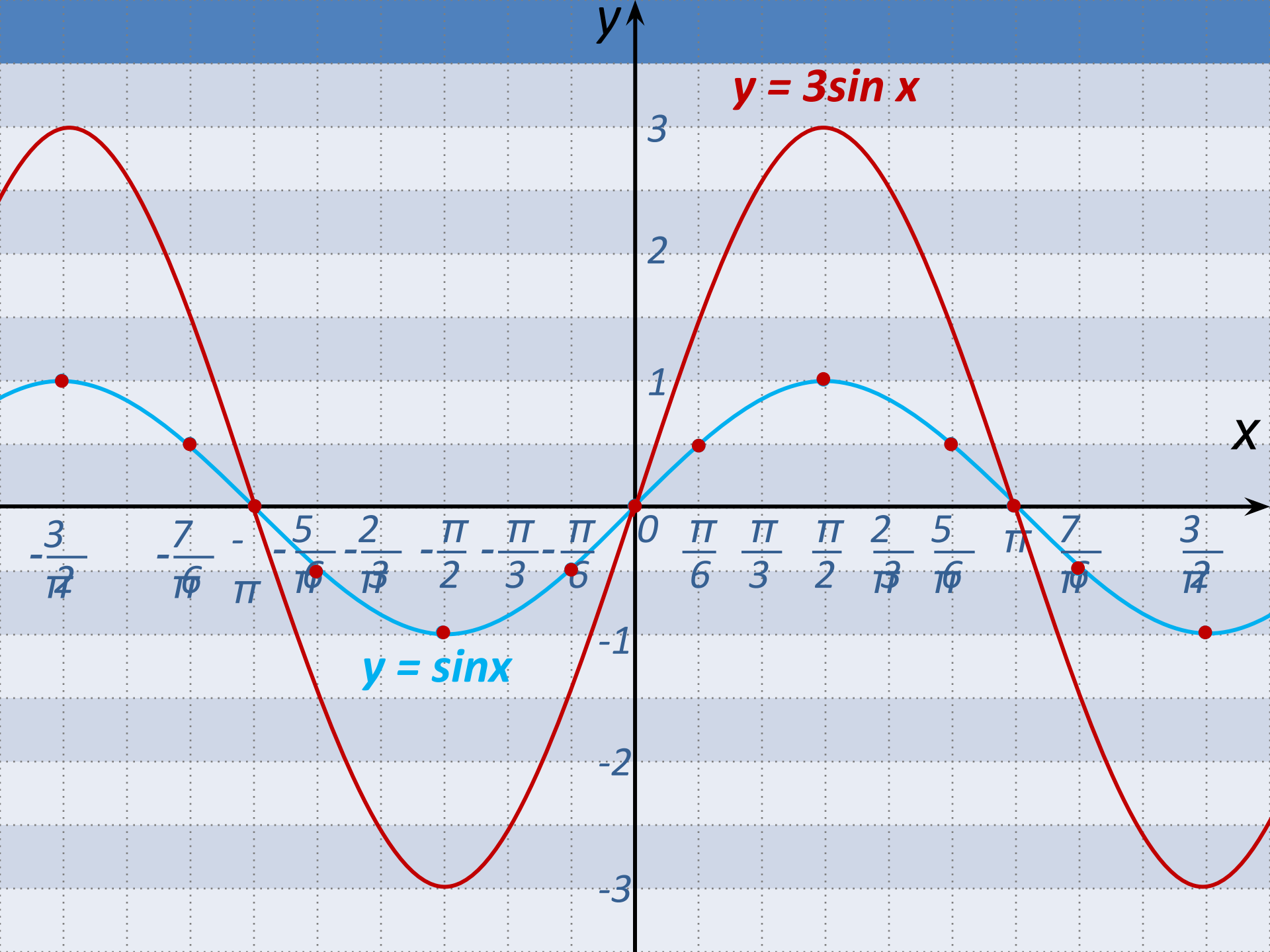
№ 16.30

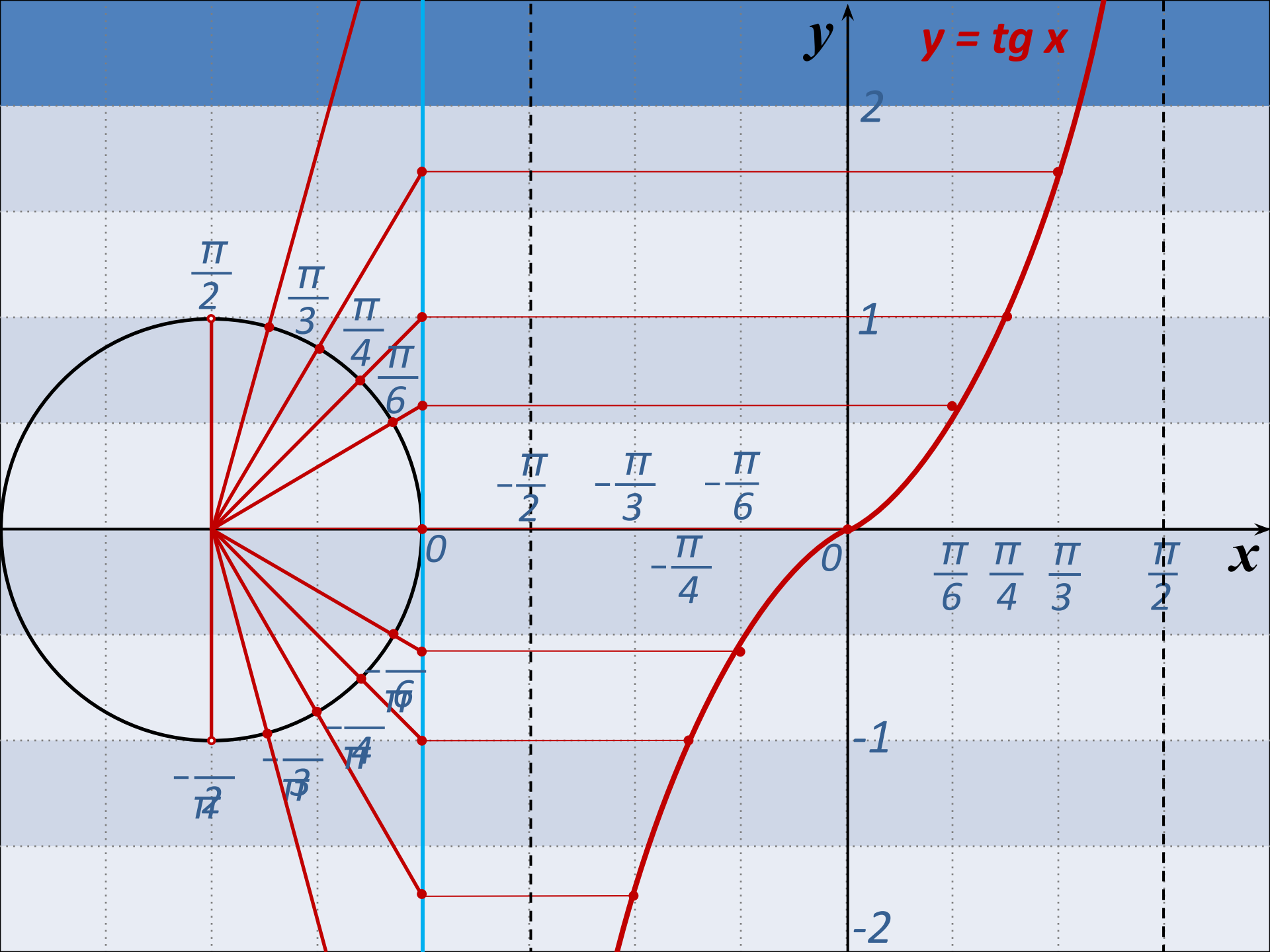
(a)

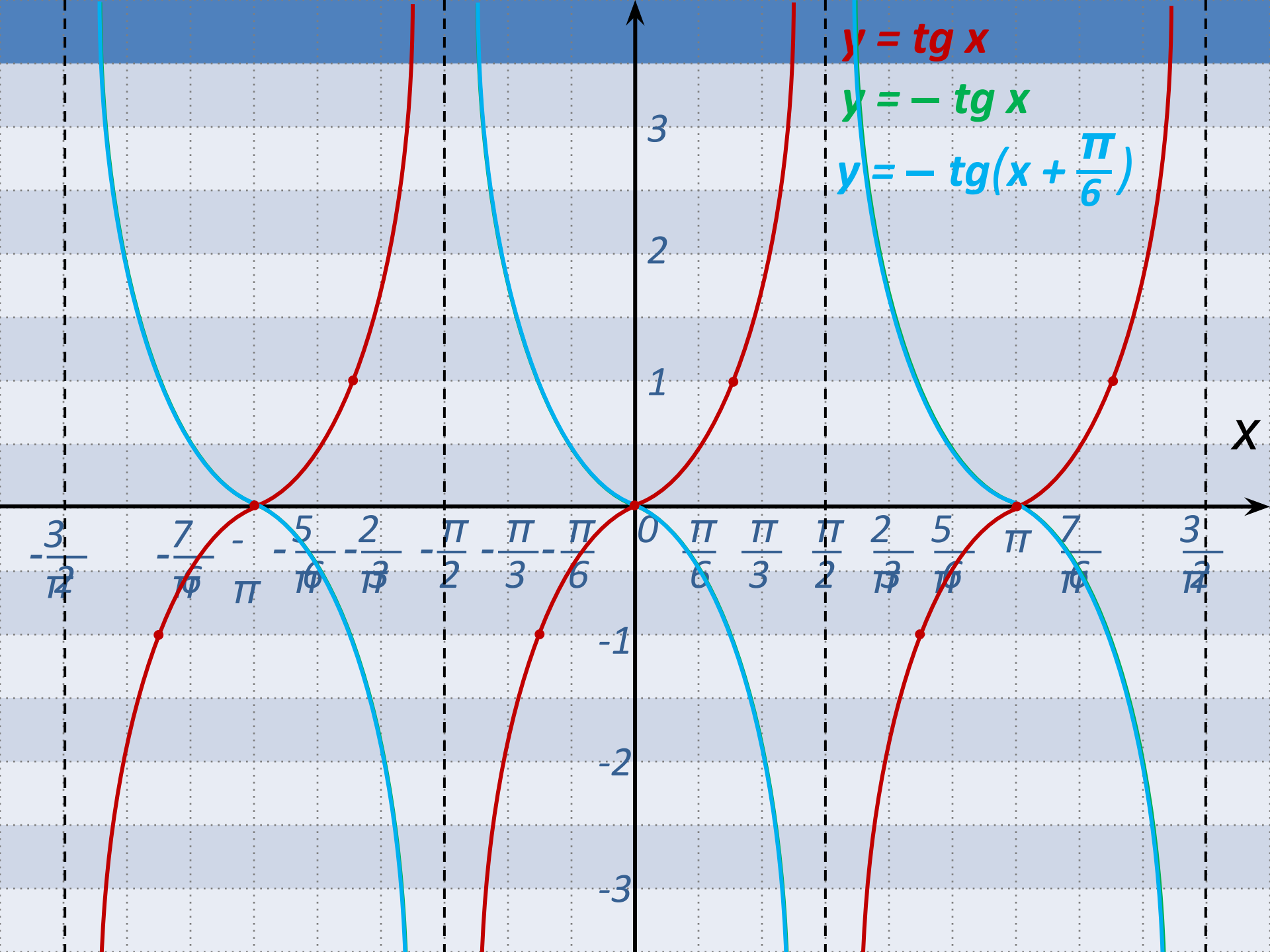

y
x
y = sin x
y = – sin x
y = – sin(x + π/6)
3
2
1
-1
-2
-3
-3π/4
-7π/6
-π
-5π/6
-2π/3
-π/2
-π/3
-π/6
0
π/6
π/3
π/2
2π/3
5π/6
π
7π/6
3π/4

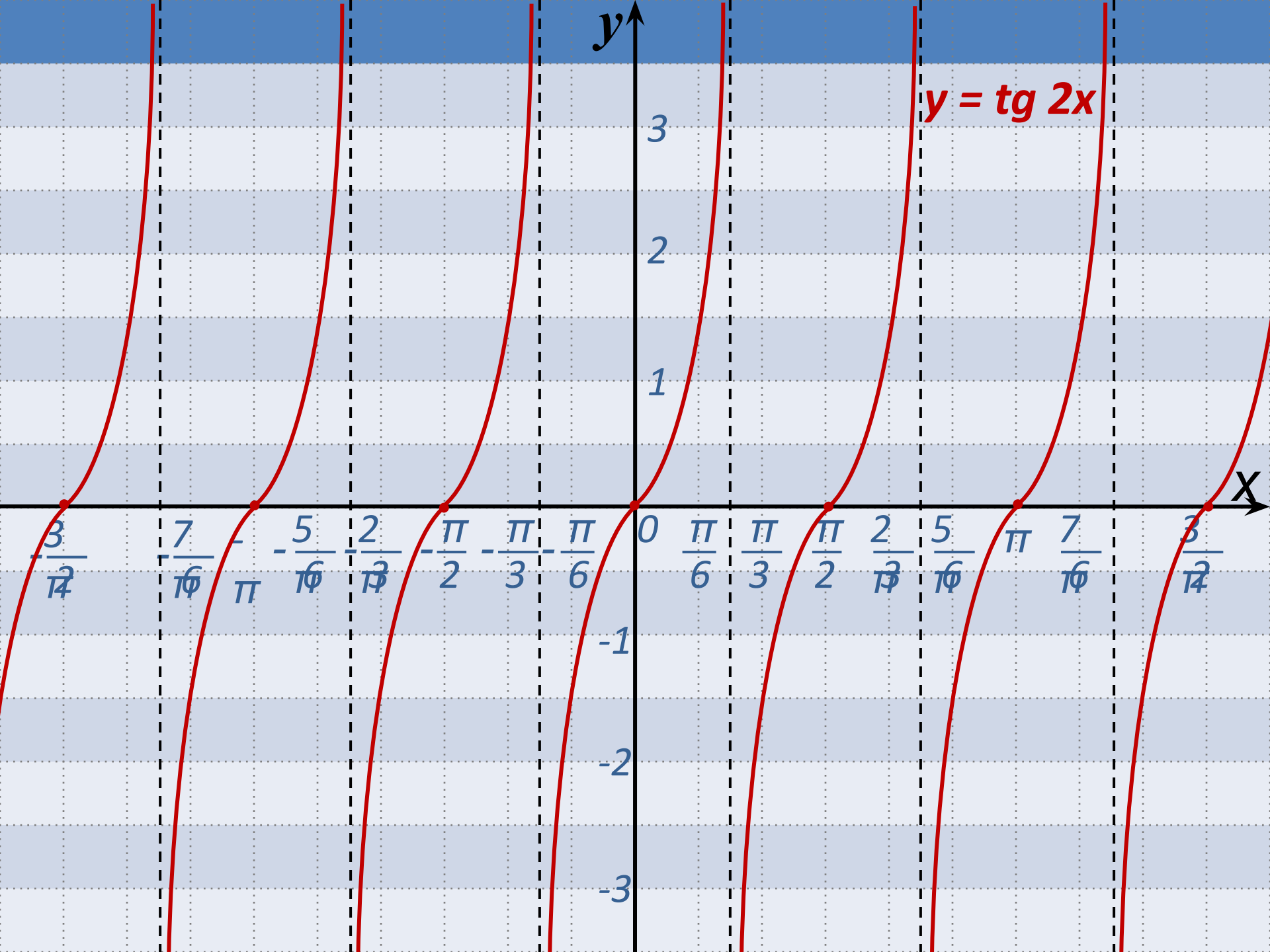

y
x
y = sin x
y = sin 2x
y = sin 0,5x
3
2
1
-1
-2
-3
-3π/2
-7π/6
-π
-5π/6
-2π/3
-π/2
-π/3
-π/6
0
π/6
π/3
π/2
2π/3
5π/6
π
7π/6
3π/2

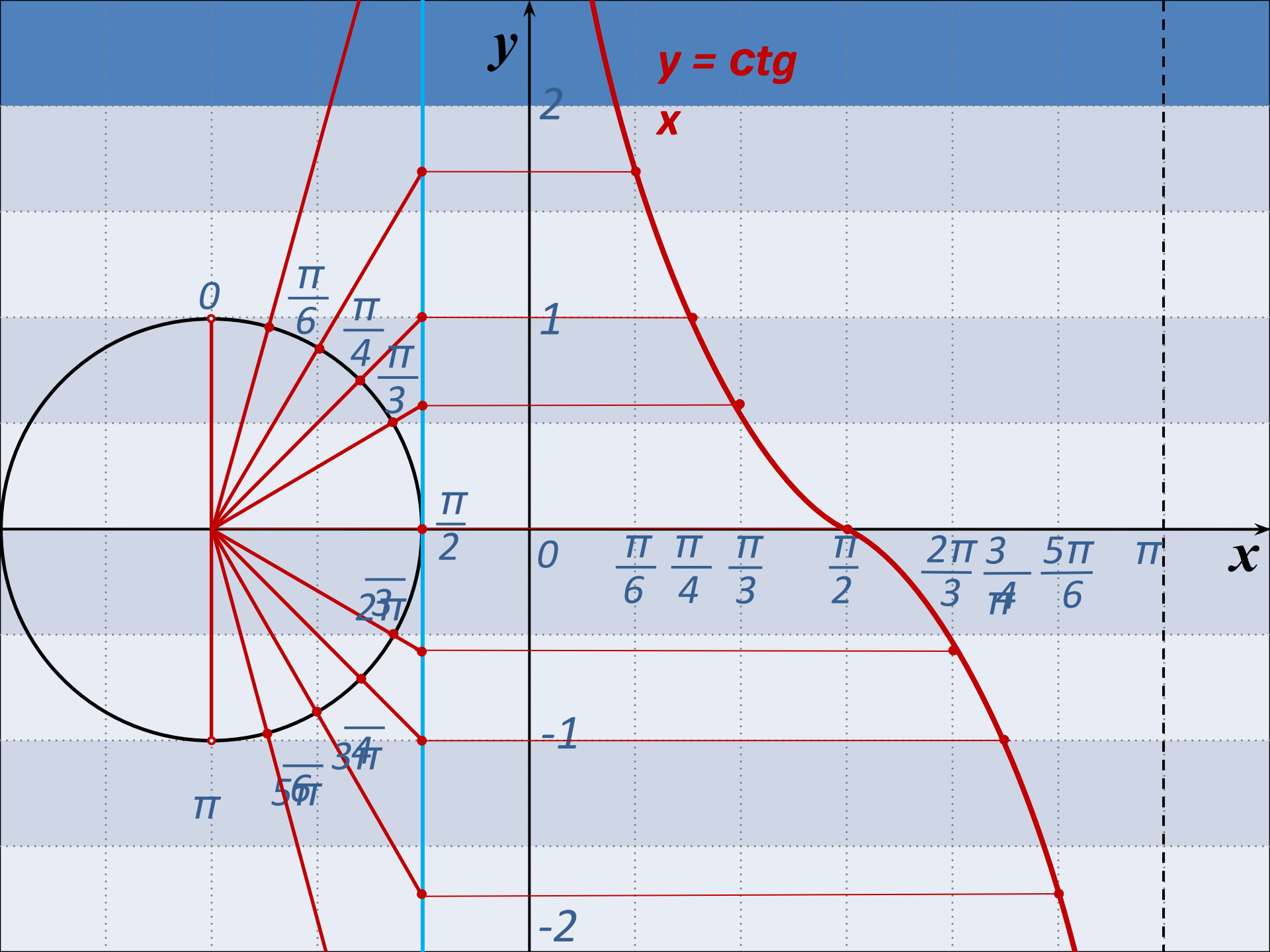

y = cos x
y = cos 3x
y = cos 3x/2
y
x
3
2
1
0
-1
-2
-3

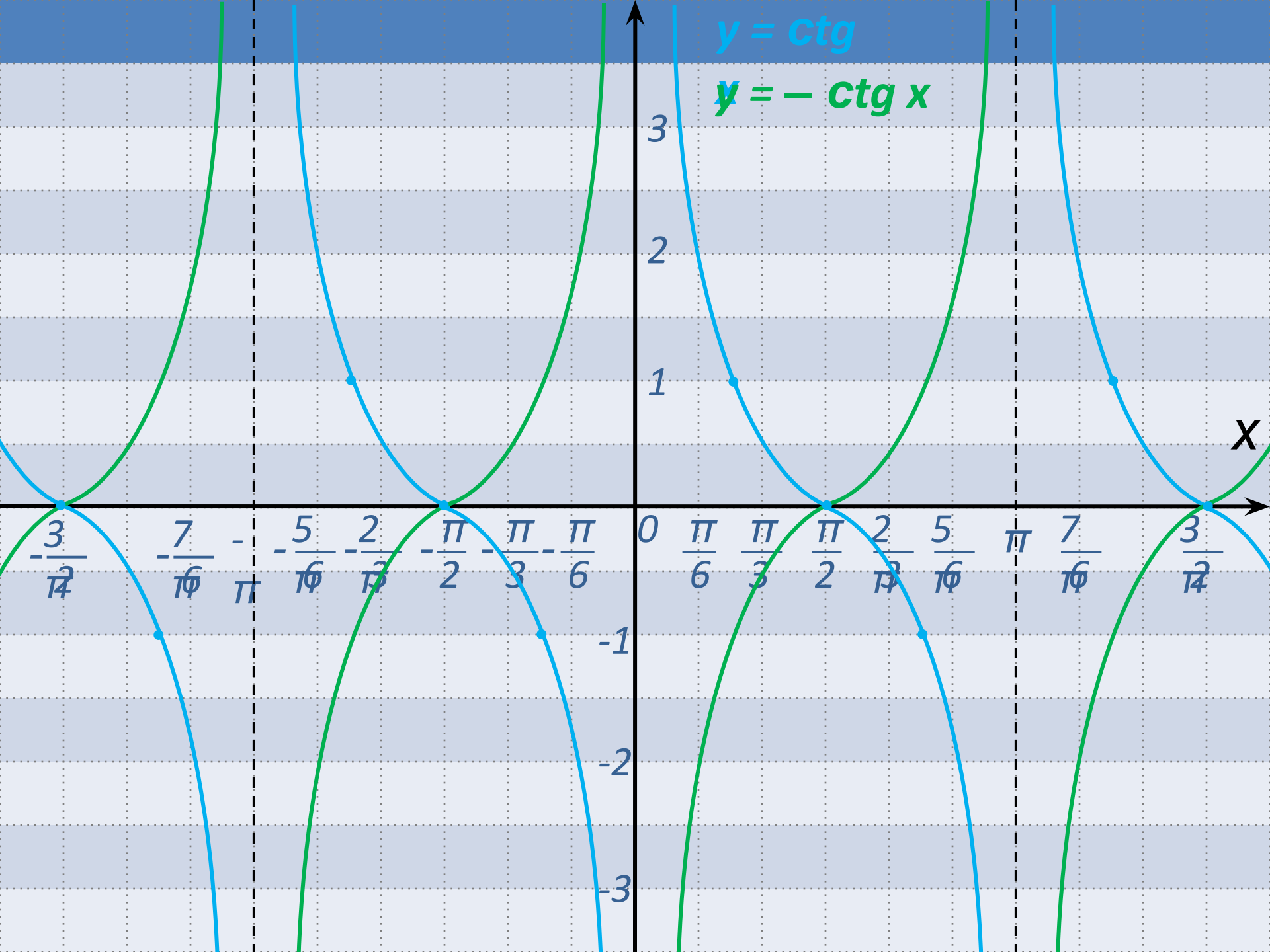

y
x
y = 3sin x
y = sinx
3
2
1
-1
-2
-3
-3π/4
-7π/6
-π
-5π/6
-2π/3
-π/2
-π/3
-π/6
0
π/6
π/3
π/2
2π/3
5π/6
π
7π/6
3π/4

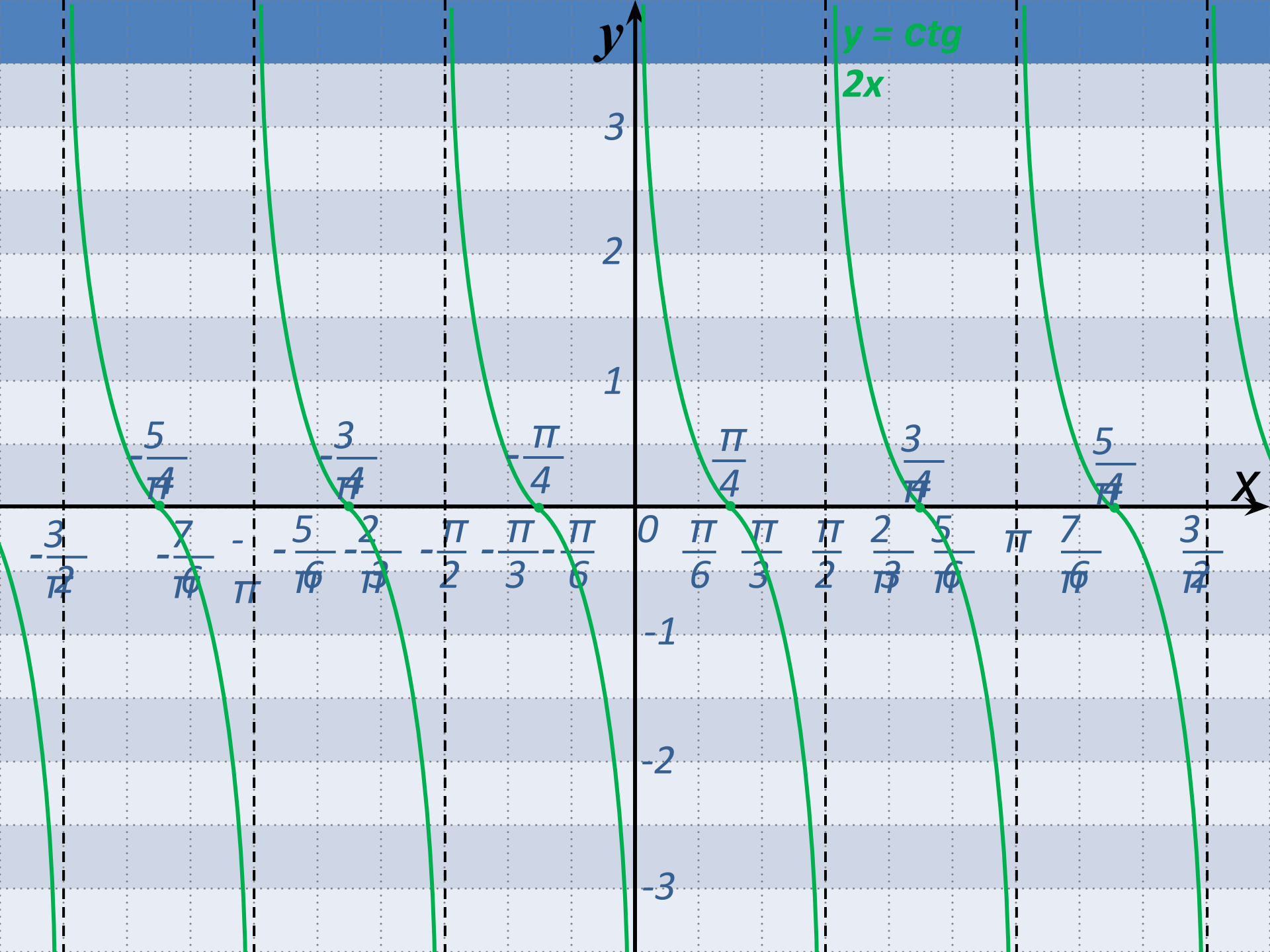

y
y = tg x
x
2
1
-1
-2
0
0
π/2
π/3
π/4
π/6
-π/2
-π/3
-π/6
-π/4
π/6
π/4
π/3
π/2
-π/6
-π/4
-π/3
-π/2


y = tg x
y = – tg x
y = – tg(x + π/6)
x
3
2
1
-1
-2
-3
0
-3π/4
-7π/6
-π
-5π/6
-2π/3
-π/2
-π/3
-π/6
π/6
π/3
π/2
2π/3
5π/6
π
7π/6
3π/4


y
x
y = tg 2x
3
2
1
-1
-2
-3
0
$-\frac{3\pi}{4}$
$-\frac{7\pi}{6}$
$-\pi$
$-\frac{5\pi}{6}$
$-\frac{2\pi}{3}$
$-\frac{\pi}{2}$
$-\frac{\pi}{3}$
$-\frac{\pi}{6}$
$\frac{\pi}{6}$
$\frac{\pi}{3}$
$\frac{\pi}{2}$
$\frac{2\pi}{3}$
$\frac{5\pi}{6}$
π
$\frac{7\pi}{6}$
$\frac{3\pi}{4}$


y
y = ctg x
2
1
-1
-2
0
π/6
π/4
π/3
π/2
2π/3
3π/4
5π/6
π
x
0
π/6
π/4
π/3
π/2
2π/3
3π/4
5π/6
π


y = ctg
y = – ctg x
X
3
2
1
-1
-2
-3
0
$-\frac{3\pi}{4}$
$-\frac{7\pi}{6}$
$-\pi$
$-\frac{5\pi}{6}$
$-\frac{2\pi}{3}$
$-\frac{\pi}{2}$
$-\frac{\pi}{3}$
$-\frac{\pi}{6}$
$\frac{\pi}{6}$
$\frac{\pi}{3}$
$\frac{\pi}{2}$
$\frac{2\pi}{3}$
$\frac{5\pi}{6}$
π
$\frac{7\pi}{6}$
$\frac{3\pi}{4}$


y
x
y = ctg
2x
3
2
1
-1
-2
-3
0
$-\frac{3\pi}{4}$
$-\frac{5\pi}{4}$
$-\pi$
$-\frac{7\pi}{6}$
$-\frac{2\pi}{3}$
$-\frac{5\pi}{6}$
$-\frac{\pi}{2}$
$-\frac{\pi}{3}$
$-\frac{\pi}{4}$
$-\frac{\pi}{6}$
$\frac{\pi}{6}$
$\frac{\pi}{4}$
$\frac{\pi}{3}$
$\frac{\pi}{2}$
$\frac{2\pi}{3}$
$\frac{3\pi}{4}$
$\frac{5\pi}{6}$
π
$\frac{7\pi}{6}$
$\frac{5\pi}{4}$