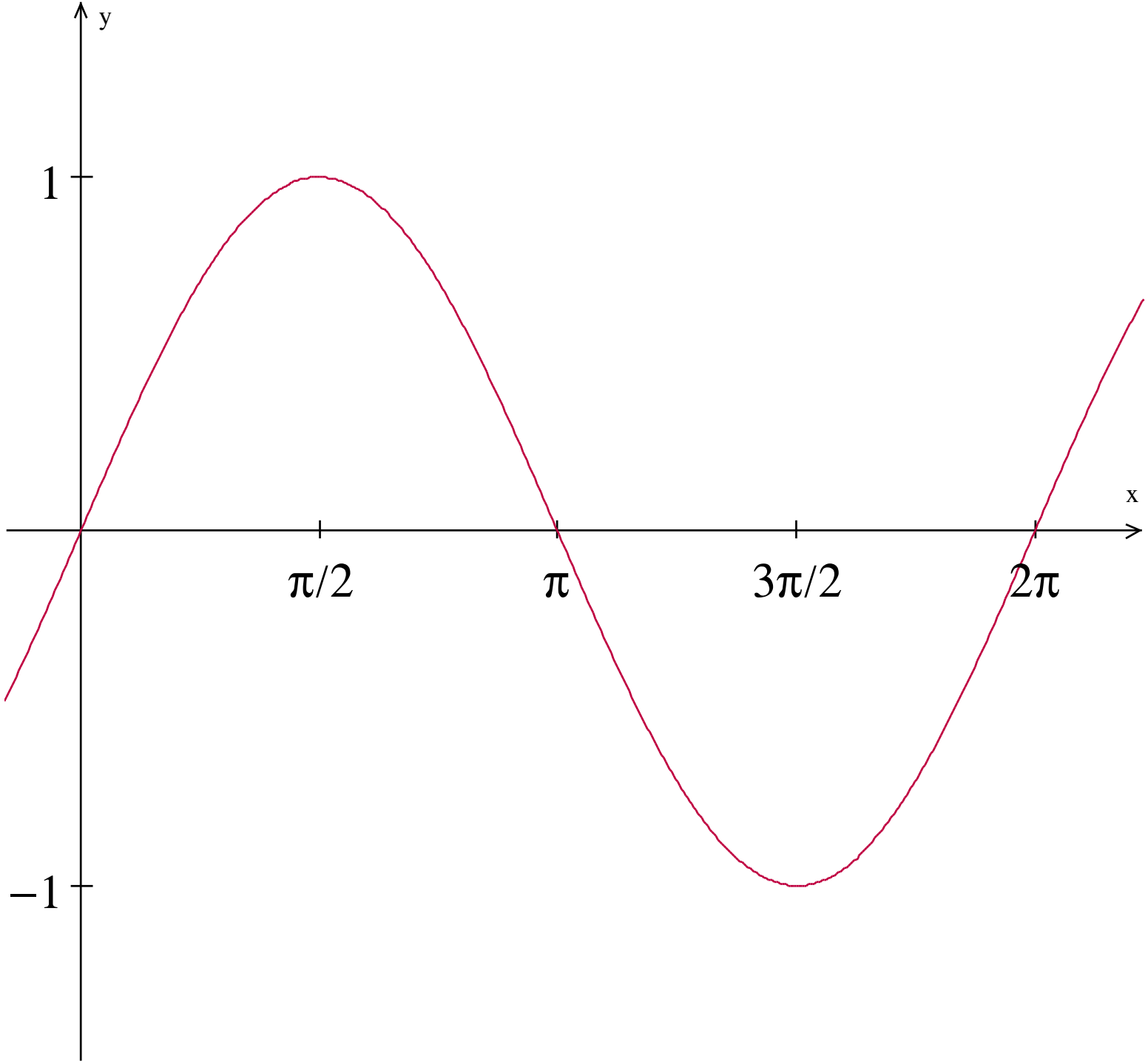
$$\boxed{y = a\sin[b(x-c)]}$$

$$y = \sin x$$

$$amplitude = a$$

$$period = \frac{2\pi}{|b|}$$

$$\sin x = \cos\left(x - \frac{\pi}{2}\right)$$


y
1
−1
x
π/2
π
3π/2
2π

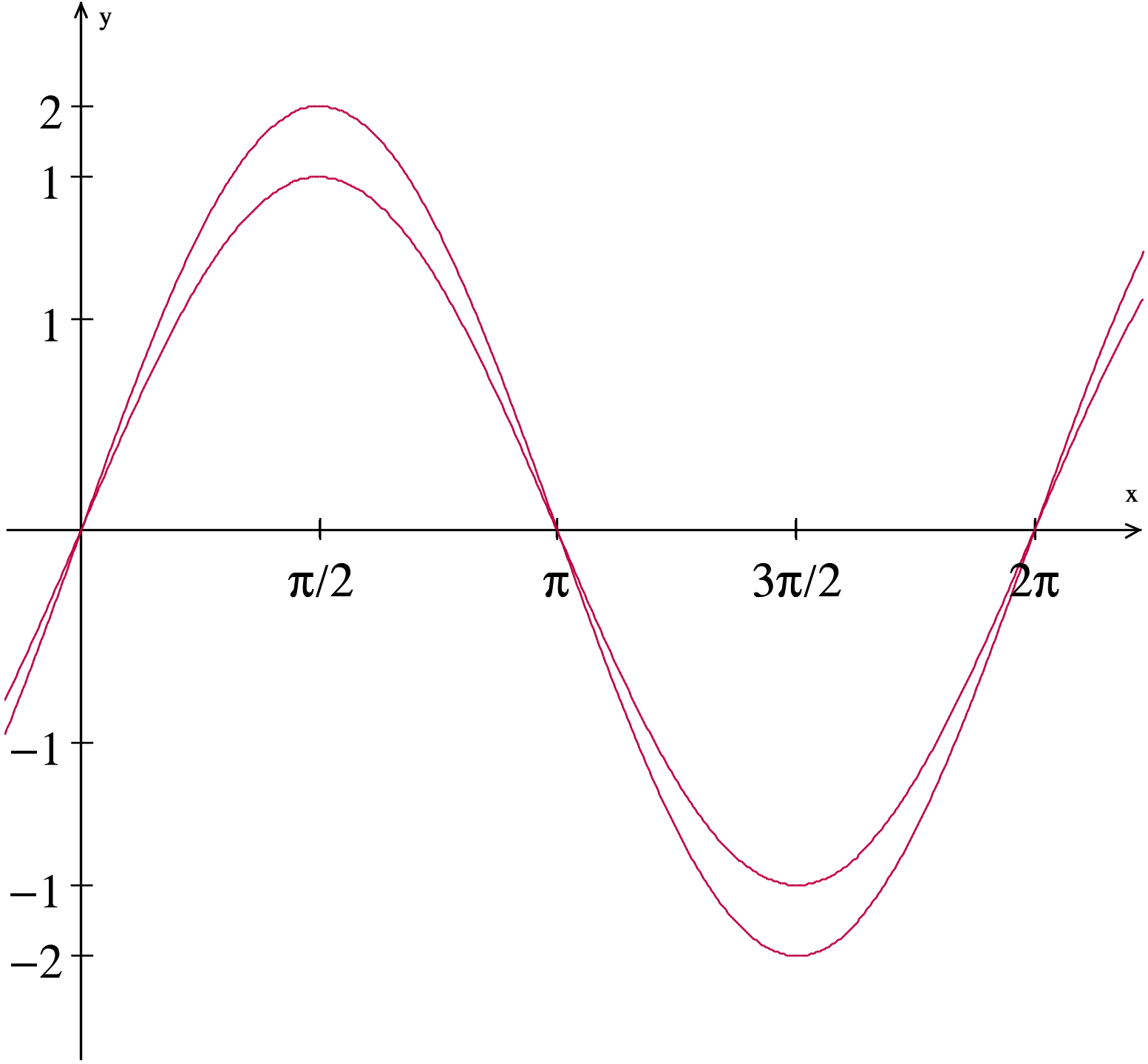
$$y = a\sin[b(x-c)]$$

$$y = \sin x$$

$$amplitude = a \longrightarrow y = 2\sin x$$

$$period = \frac{2\pi}{|b|}$$

$$\sin x = \cos\left(x - \frac{\pi}{2}\right)$$


y
2
1
1
x
π/2
π
3π/2
2π
−1
−1
−2

$$y = a\sin[b(x-c)]$$

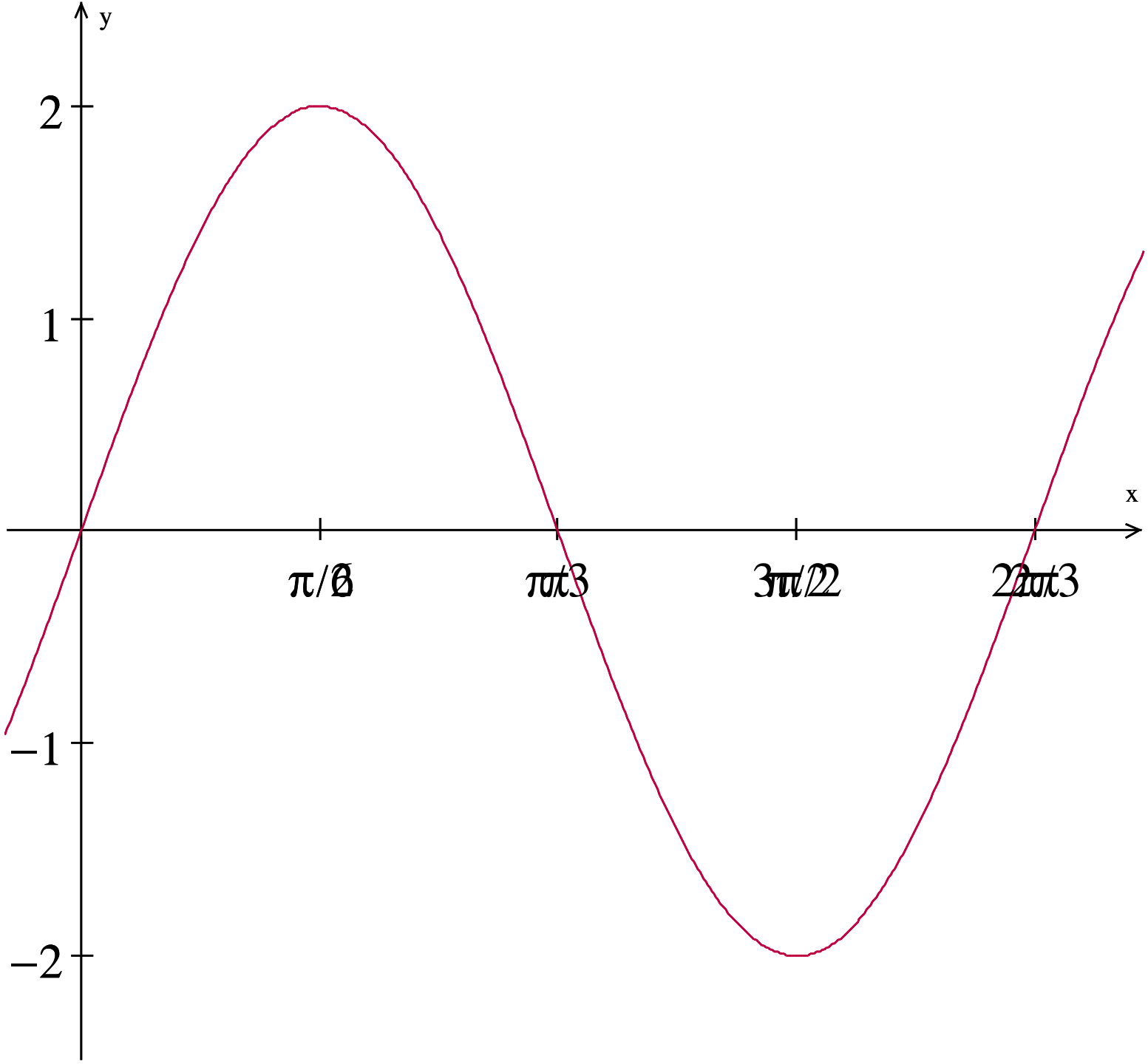
$$y = \sin x$$

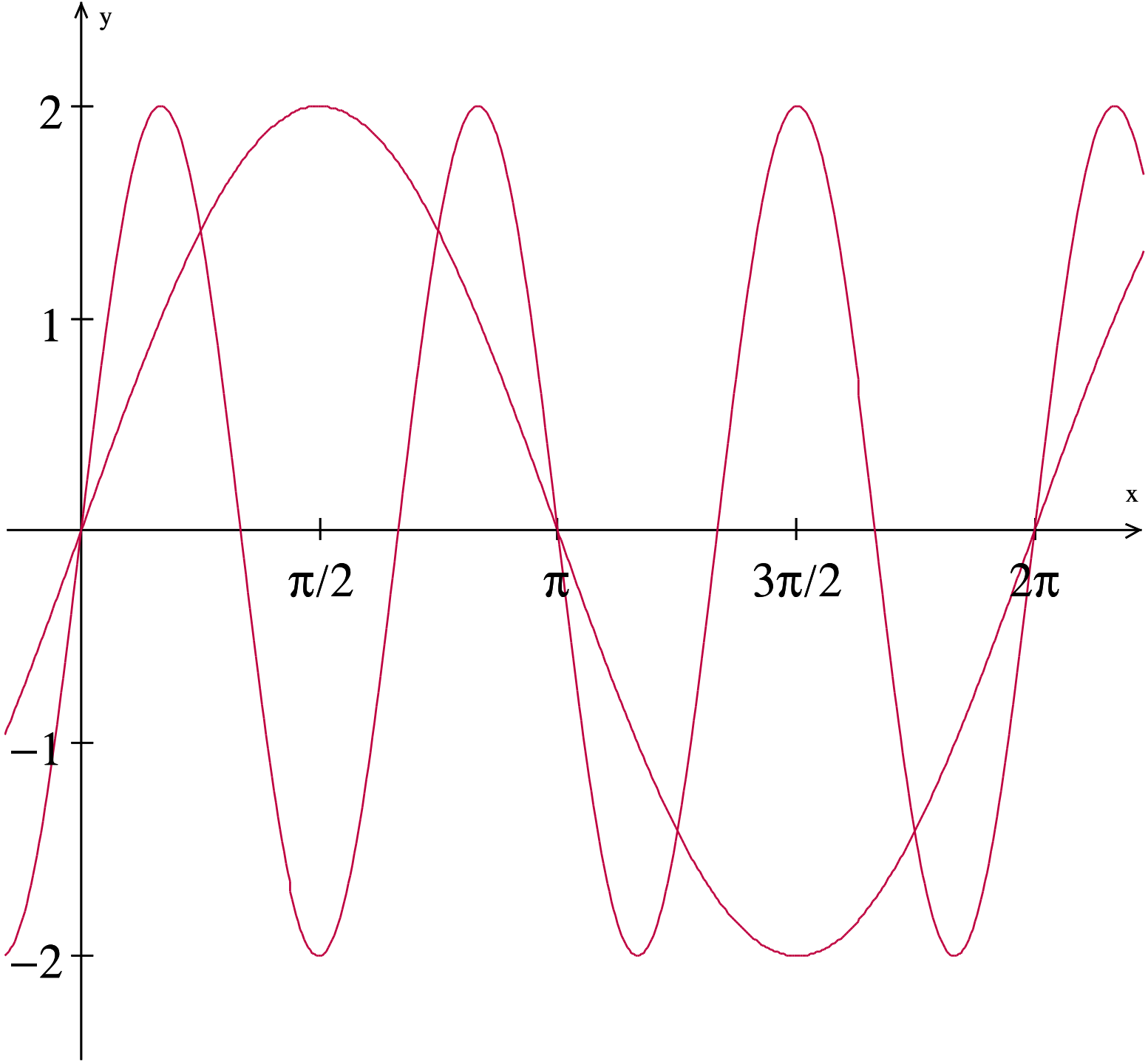
$$amplitude = a$$

$$y = 2\sin x$$

$$period = \frac{2\pi}{|b|} \longrightarrow y = 2\sin 3x$$

$$\sin x = \cos\left(x - \frac{\pi}{2}\right)$$


y
2
1
−1
−2
x
π/6
π/3
π/2
2π/3
π
3π/2
2π


y
2
1
−1
−2
x
π/2
π
3π/2
2π

$$y = a\sin[b(x-c)]$$

$$y = \sin x$$

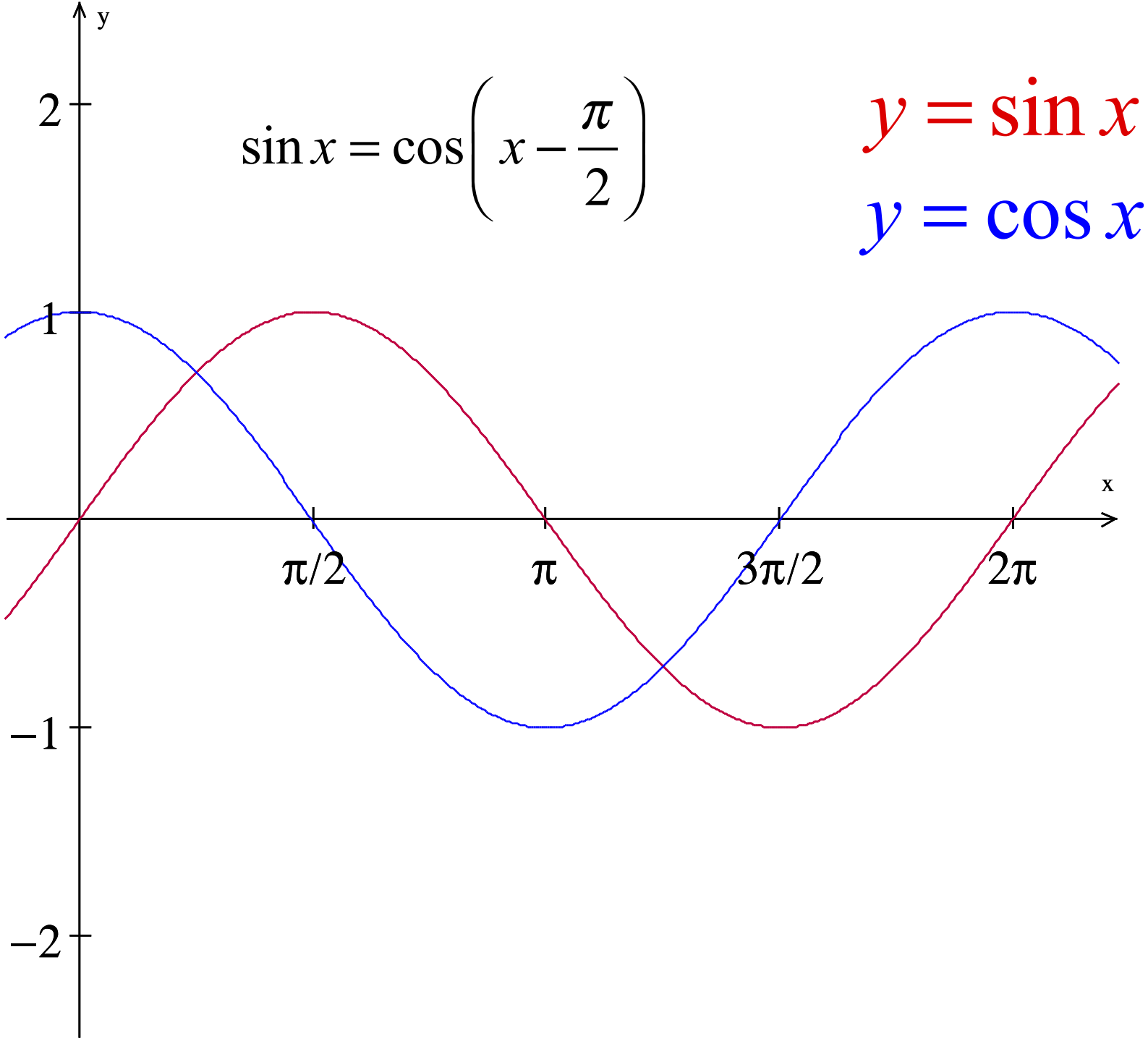
$$amplitude = a$$

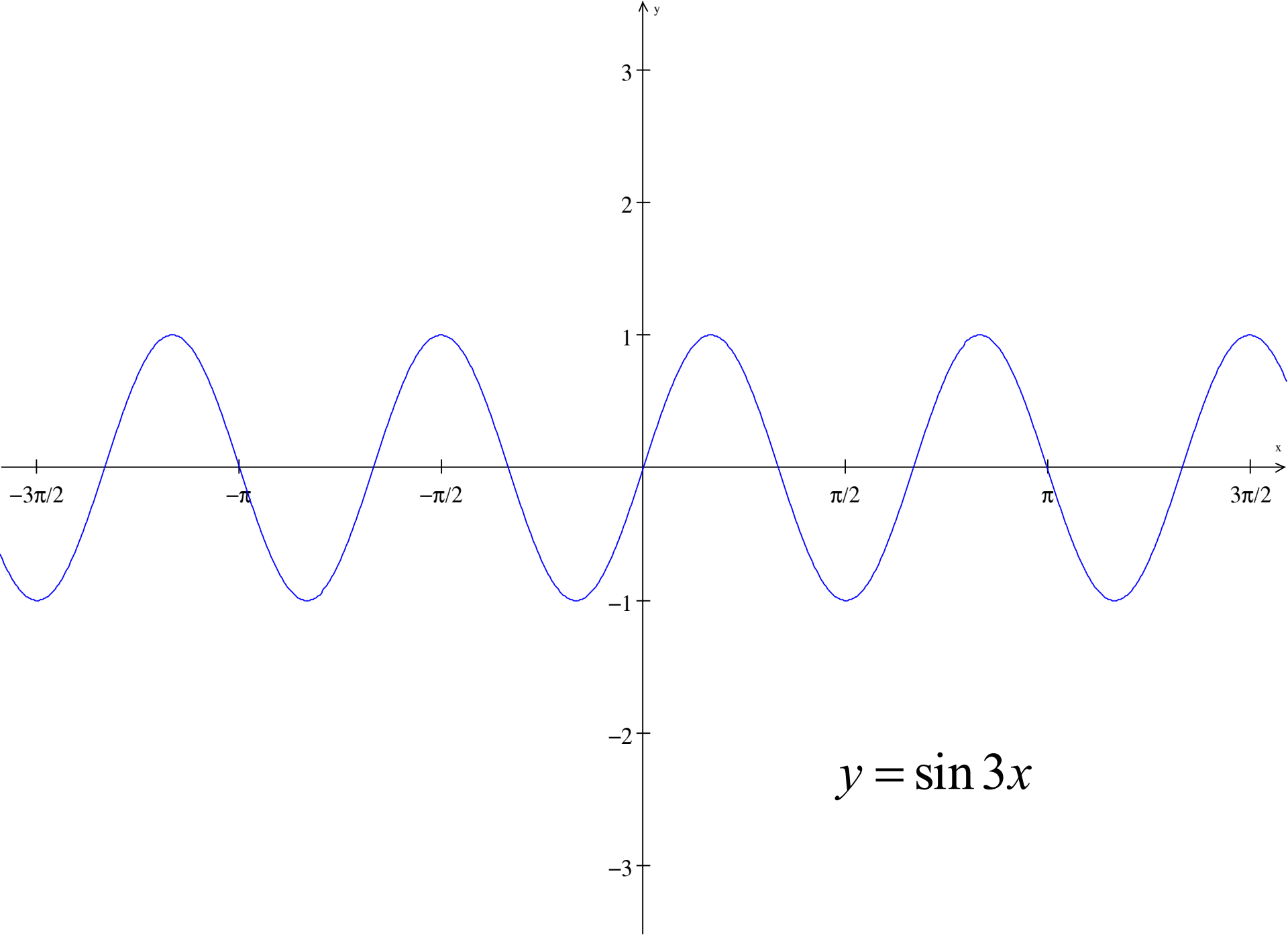
$$y = 2\sin x$$

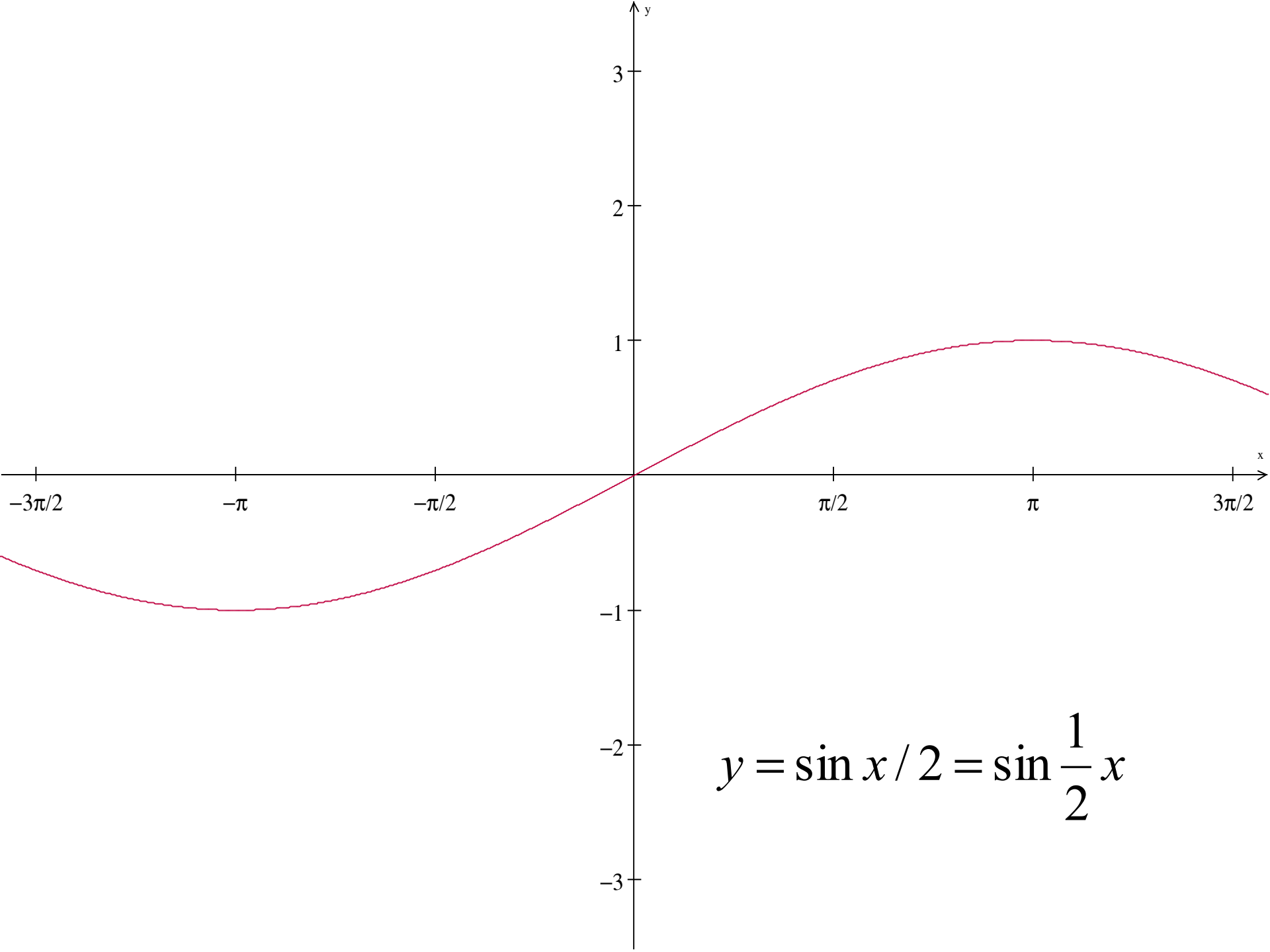
$$period = \frac{2\pi}{|b|}$$

$$y = 2\sin 3x$$

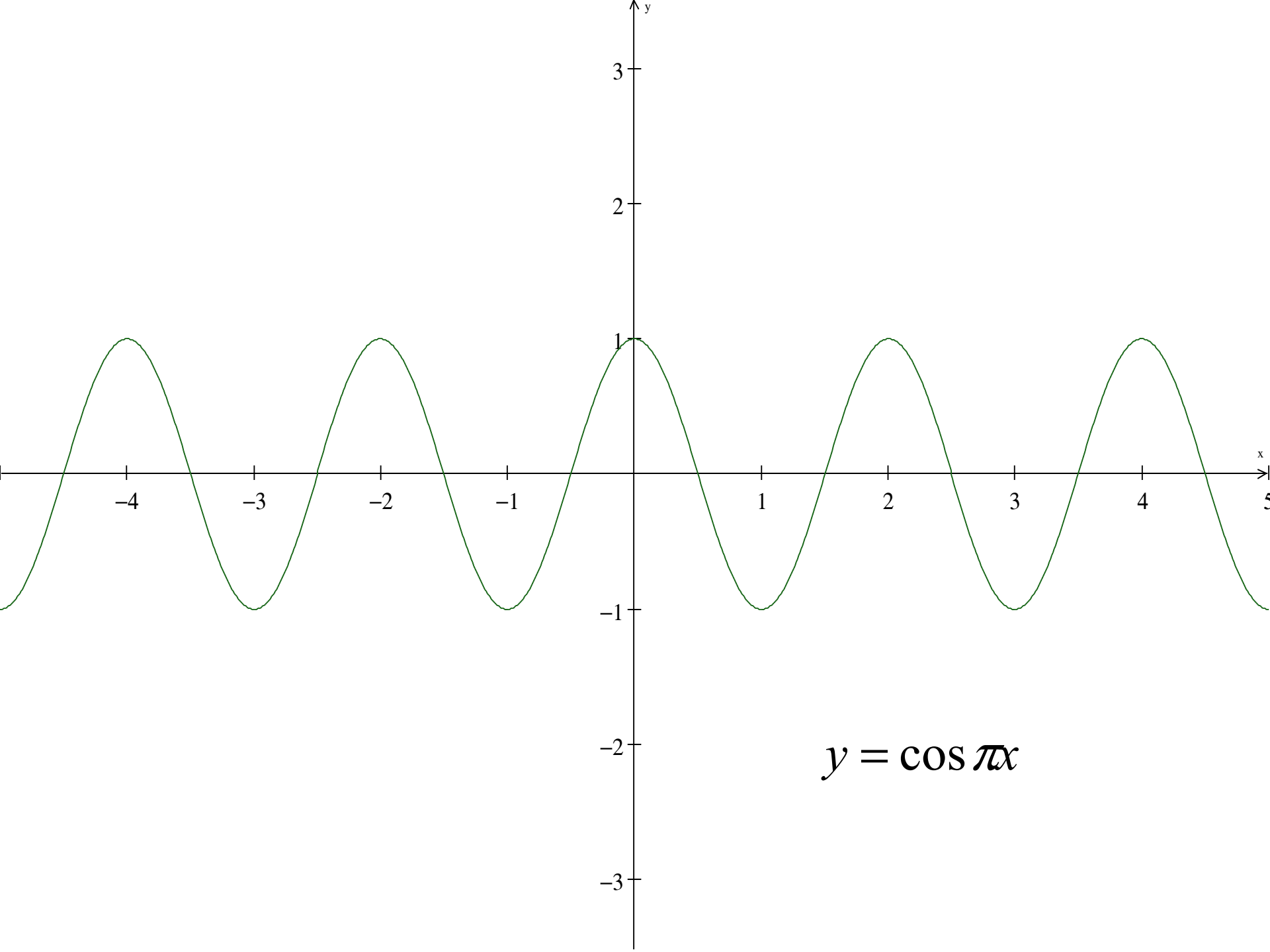
$$\sin x = \cos\left(x - \frac{\pi}{2}\right) \longrightarrow \text{Horizontal shift}$$

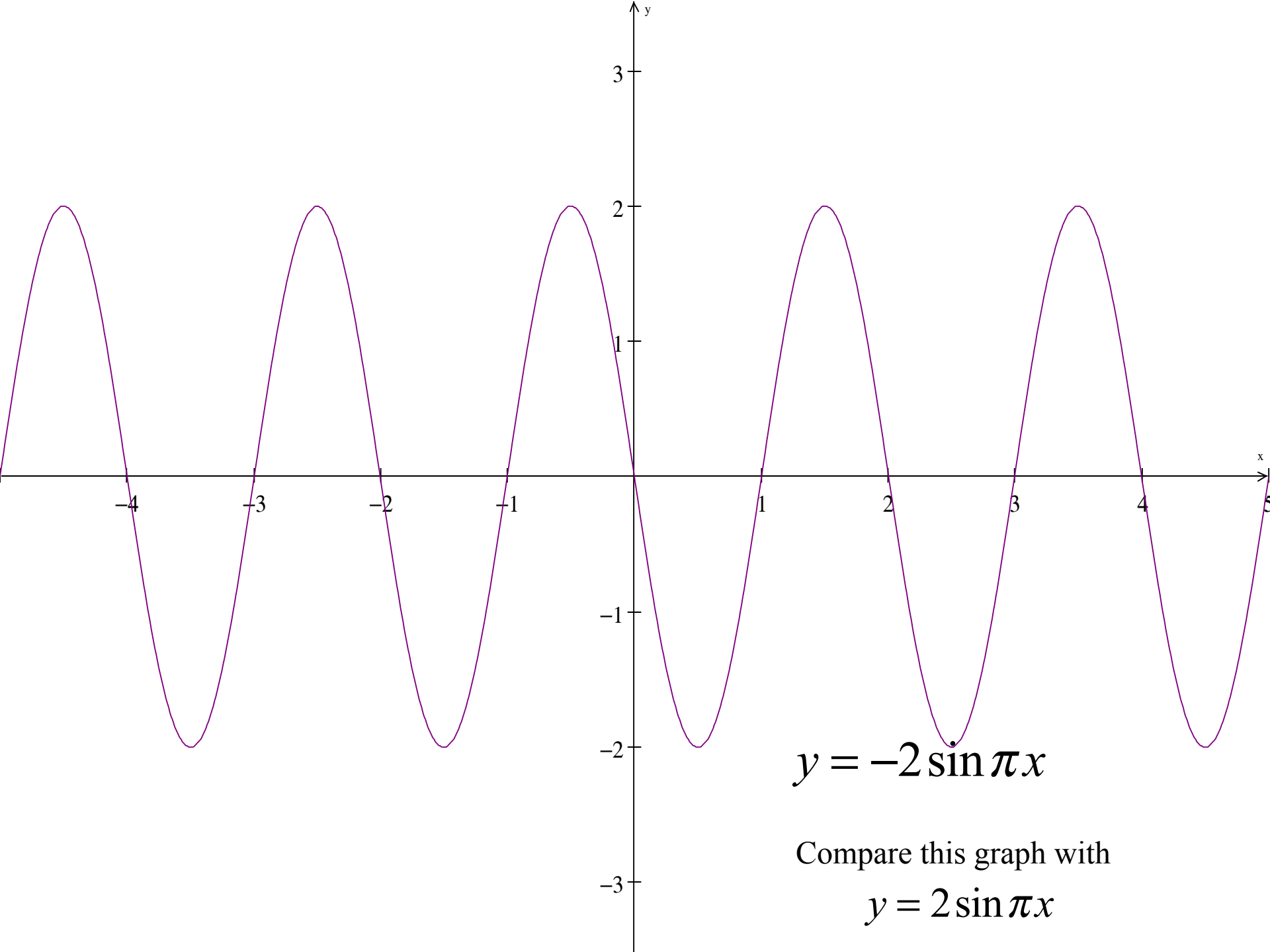

y
2
1
−1
−2
x
π/2
π
3π/2
2π
$\sin x = \cos\left(x - \frac{\pi}{2}\right)$
$y = \sin x$
$y = \cos x$


y
3
2
1
−1
−2
−3
x
−3π/2
−π
−π/2
π/2
π
3π/2
$y = \sin 3x$



$$y = \sin x / 2 = \sin \frac{1}{2} x$$


y
3
2
1
−1
−2
−3
x
−4
−3
−2
−1
1
2
3
4
5
$y = \cos \pi x$



$$y = -2\sin \pi x$$

Compare this graph with

$$y = 2\sin \pi x$$