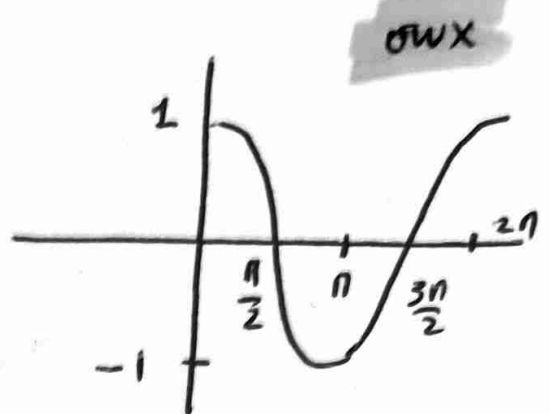
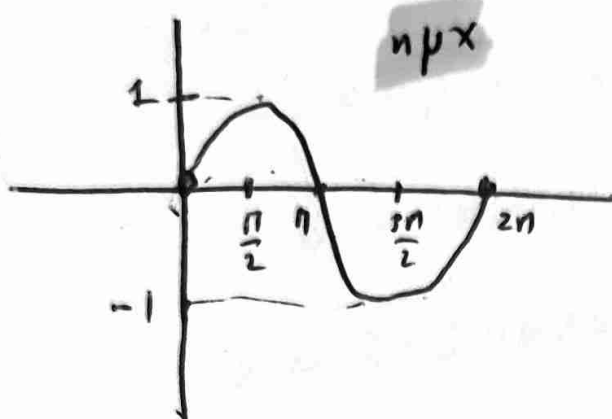


Τριγωνομετρικές Συναρτήσεις



Το $\sin x$ και το $\cos x$ έχουν
περιοδική συνάρτηση.

$$f(x) = \rho \sin \omega x + c \quad // \quad f(x) = \rho \cos \omega x + c$$

$$\text{Περίοδος} \hat{=} T = \frac{2\pi}{\omega}$$

$$\text{Max } f \hat{=} |\rho| + c$$

$$\text{Min } f \hat{=} -|\rho| + c.$$

$$f(x) = 2 - 3 \sin 2x$$

$$\omega = 2$$

$$p = -3$$

$$c = 2$$

$$\text{Периоды: } T = \frac{2\pi}{\omega} \Rightarrow T = \frac{2\pi}{2} \Rightarrow \underline{\underline{T = \pi}}$$

$$\frac{\text{амплитуда}}{-1 \leq \sin 2x \leq 1}$$

$$3 \geq -3 \sin 2x \geq -3$$

$$5 \geq 2 - 3 \sin 2x \geq -1$$

$$5 \geq f(x) \geq -1$$

↓
Max

↓
Min

Вспомогательное

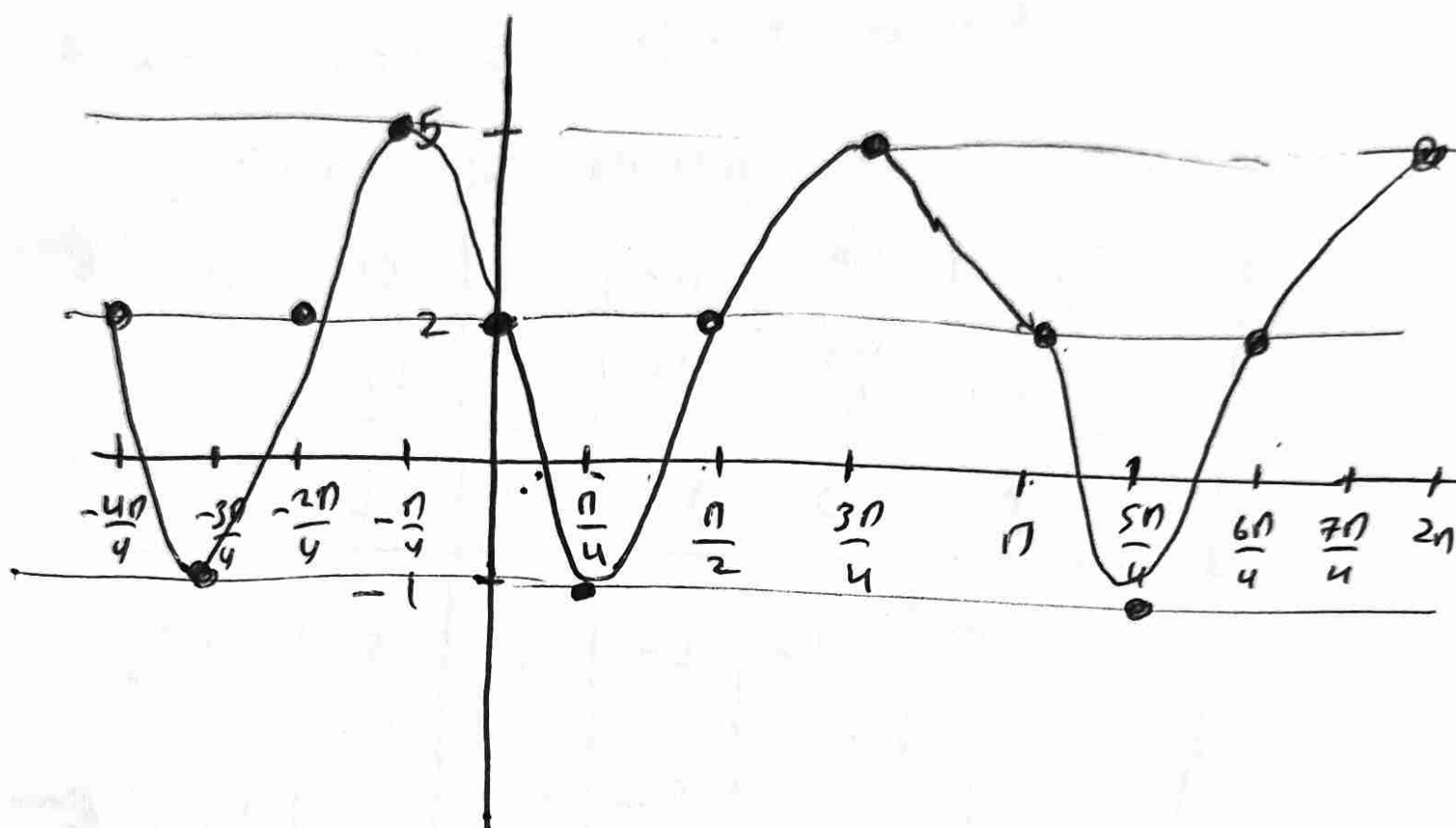
$$\text{Max } f = |p| + c = |-3| + 2 = 3 + 2 = 5$$

$$\text{Min } f = -|p| + c = -|-3| + 2 = -3 + 2 = -1$$

$$f(x) = 2 - 3 \sin 2x$$

$2x$	0	$\frac{\pi}{2}$	π	$\frac{3\pi}{2}$	2π
x	0	$\frac{\pi}{4}$	$\frac{\pi}{2}$	$\frac{3\pi}{4}$	π
$\sin 2x$	0	1	0	-1	0
$-3 \sin 2x$	0	-3	0	3	0
$f(x)$	2	-1	2	5	2

$$T = \pi$$



$$f(x) = -1 + 2\omega \left(\frac{x}{3} \right)$$

$$\omega = \frac{1}{3}$$

$$p=2$$

$$c = -1$$

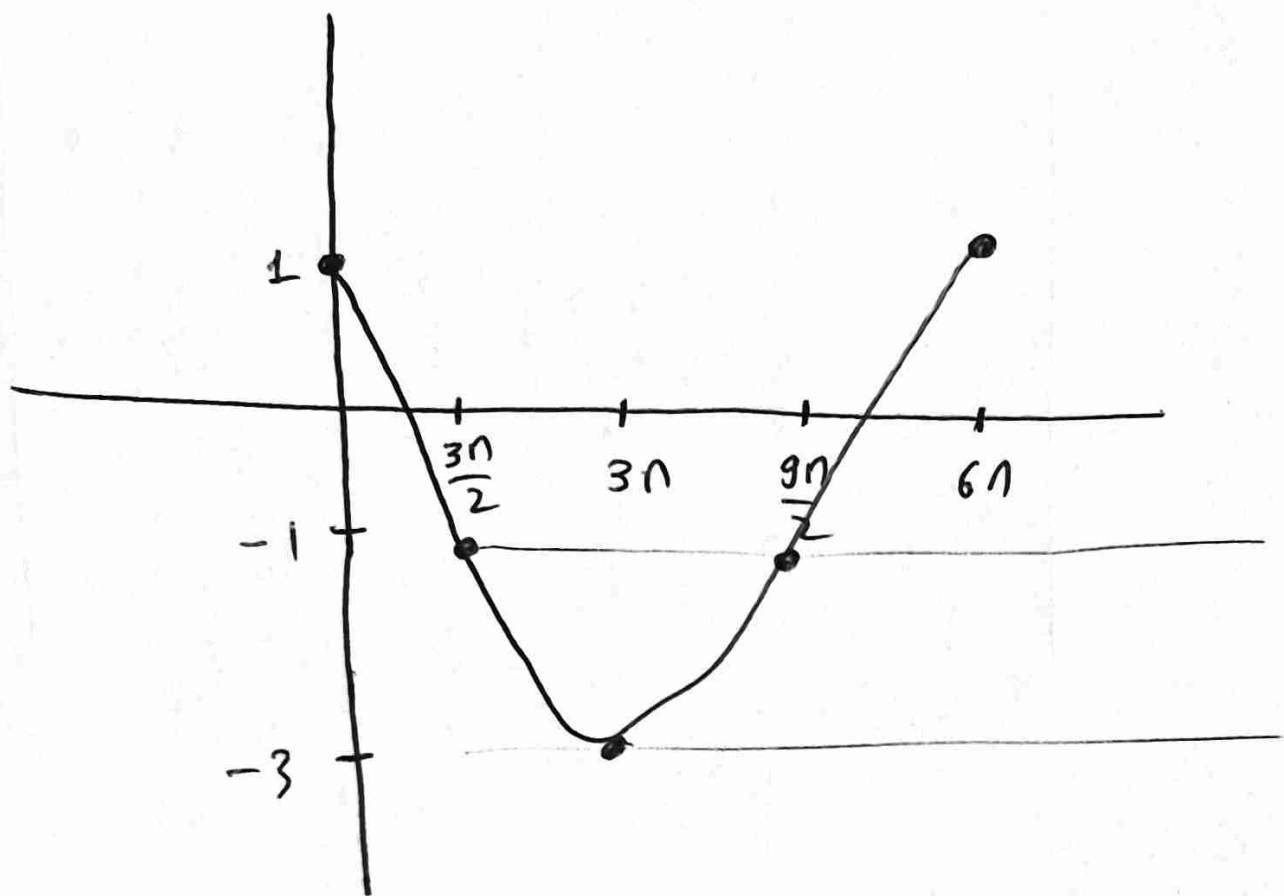
$$T = \frac{2\pi}{\omega} = \frac{2\pi}{\frac{1}{3}} = 6\pi \quad \Rightarrow \underline{\underline{T=6\pi}}$$

$$\text{Max} \approx |p| + c = |2| - 1 = 1$$

$$\text{Min} \approx -|p| + c = -|2| - 1 = -3$$

Διαφορική οντίκη

x	0	$\frac{3\pi}{2}$	3π	$\frac{9\pi}{2}$	6π
$\frac{x}{3}$	0	$\frac{\pi}{2}$	π	$\frac{3\pi}{2}$	2π
$\omega \frac{x}{3}$	1	0	-1	0	1
$2\omega \frac{x}{3}$	2	0	-2	0	2
$f(x)$	1	-1	-3	-1	1



20.

$$S = 50 + 20 \mu \frac{\eta t}{3} \quad T_{1 \mu m}.$$

$$Max: |p| + C = |20| + 50 = \underline{\underline{70}}$$

$$\omega = \frac{\eta}{3}$$

$$\rho = 20$$

$$Min: -|p| + C = -|20| + 50 = \underline{\underline{30}}$$

$$C = 50$$

$$\Delta \varphi_{op} = 70 - 30 = \underline{\underline{40}}$$

19. $f(x) = \alpha - 2 + (B-1) \sigma \omega (r \pi x)$ $\alpha < 2$
 $B > 1$

$T = \frac{1}{3}$, $min = -14$ $A(\frac{1}{18}, 1)$ $\gamma > 0$

• $T = \frac{2\eta}{\omega} \quad \Rightarrow \quad \frac{1}{3} = \frac{2\eta}{r\pi} \quad \Rightarrow \quad \underline{\underline{\gamma = 6}}$

• $min f = -|p| + C \quad \Rightarrow \quad -14 = -|B-1| + \alpha - 2$

$$-14 = -(B-1) + \alpha - 2$$

$$-14 = -B + 1 + \alpha - 2$$

$$\sqrt{B - \alpha = 13}$$

$$f\left(\frac{1}{18}\right) = 1$$

$$\alpha - 2 + (\beta - 1) \sin\left(60 \frac{1}{18}\right) = 1$$

$$\alpha - 2 + (\beta - 1) \sin \frac{\pi}{3} = 1$$

$$\alpha - 2 + (\beta - 1) \frac{1}{2} = 1$$

$$2\alpha - 4 + \beta - 1 = 1$$

$$\boxed{2\alpha + \beta = 6}$$

$$\begin{cases} \beta - \alpha = 13 \\ 2\alpha + \beta = 6 \end{cases} \Rightarrow -\beta + \alpha = -13 \quad \text{---} \oplus$$

$$3\alpha = -7$$

$$\alpha = -\frac{7}{3} \quad \text{K} \checkmark$$