Trouver les zéros des fonctions suivantes :

1. $f(x) = 4\sin 2(x+4) - 3$
2. $g(x) = -3\sin - 3\pi(x-2) + 2$
3. h(x) = 4sin 6(x-3) + 3
4. $i(x) = 3\cos 4\pi(x+2) - 2$

Solutions

1. $f(x) = 4\sin 2(x+4) - 3$

4sin2(x+4) -3 = 0
4sin2(x+4) = 3
sin2(x+4) = ¾

θ = 2(x+4)
Sinθ = ¾ ➔ $\theta_1 = \sin^{-1}(3/4) = 0{,}8481$
$\theta_2 = \pi - \theta_1 = 2{,}2935$

2(x+4) = 0,8481
x + 4 = 0,42405
x = -3,576

2(x+4) = 2,2935
x + 4 = 1,14675
x = -2,8533

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

S = {-3,576 + πn, -2,8533 + πn }, n ε Z

/**********/

2. $g(x) = -3\sin - 3\pi(x-2) + 2$

$-3\sin - 3\pi(x-2) + 2 = 0$
$-3\sin - 3\pi(x-2) = -2$
$\sin - 3\pi(x-2) = 2/3$

θ = -3π(x-2)
Sinθ = 2/3 ➔ $\theta_1 = \sin^{-1}(2/3) = 0{,}7297$
$\theta_2 = \pi - \theta_1 = 2{,}4119$

$-3\pi(x-2) = 0{,}7297$
x – 2 = -0,0774
x = 1,9226

$-3\pi(x-2) = 2{,}4119$
x – 2 = -0,2559
x = 1,7441

$$P = \frac{2\pi}{|b|} = \frac{2\pi}{3\pi} = \frac{2}{3}$$

S = {1,7441 + 2/3n, 1,9226 + 2/3n }, n ε Z

/**********/

3. h(x) = 4sin 6(x-3) + 3

4sin6(x-3) + 3 = 0
4sin6(x-3) = - 3
sin6(x-3) = -3/4

θ = 6(x-3)
Sinθ = -¾ ➔ $\theta_1 = \sin^{-1}(-3/4) = -0{,}8481$
$\theta_2 = \pi - \theta_1 = 3{,}9897$

6(x-3) = -0,8481
x - 3 = -0,14135
x = 2,8587

$$P = \frac{2\pi}{|b|} = \frac{2\pi}{6} = \frac{\pi}{3}$$

6(x-3) = 3,9897
x – 3 = 0,66495
x = 3,66495

S = {2,8587 + (π/3)n, 3,66495 + (π/3)n }, n ε Z

/**********/

4. $i(x) = 3\cos 4\pi(x+2) - 2$

$3\cos 4\pi(x+2) - 2 = 0$
$3\cos 4\pi(x+2) = 2$
$\cos 4\pi(x+2) = \frac{2}{3}$

θ = 4π(x+2)
cosθ = 2/3 ➔ $\theta_1 = \cos^{-1}(2/3) = 0{,}8411$
$\theta_2 = 2\pi - \theta_1 = 5{,}4421$

$4\pi(x+2) = 0{,}8411$
x + 2 = 0,0669
x = -1,9331

$4\pi(x+2) = 5{,}4421$
x + 2 = 0,4331
x = -1,5669

$$P = \frac{2\pi}{|b|} = \frac{2\pi}{4\pi} = \frac{1}{2}$$

S = {-1,9331 + (1/2)n, -1,5669 + (1/2)n }, n ε Z