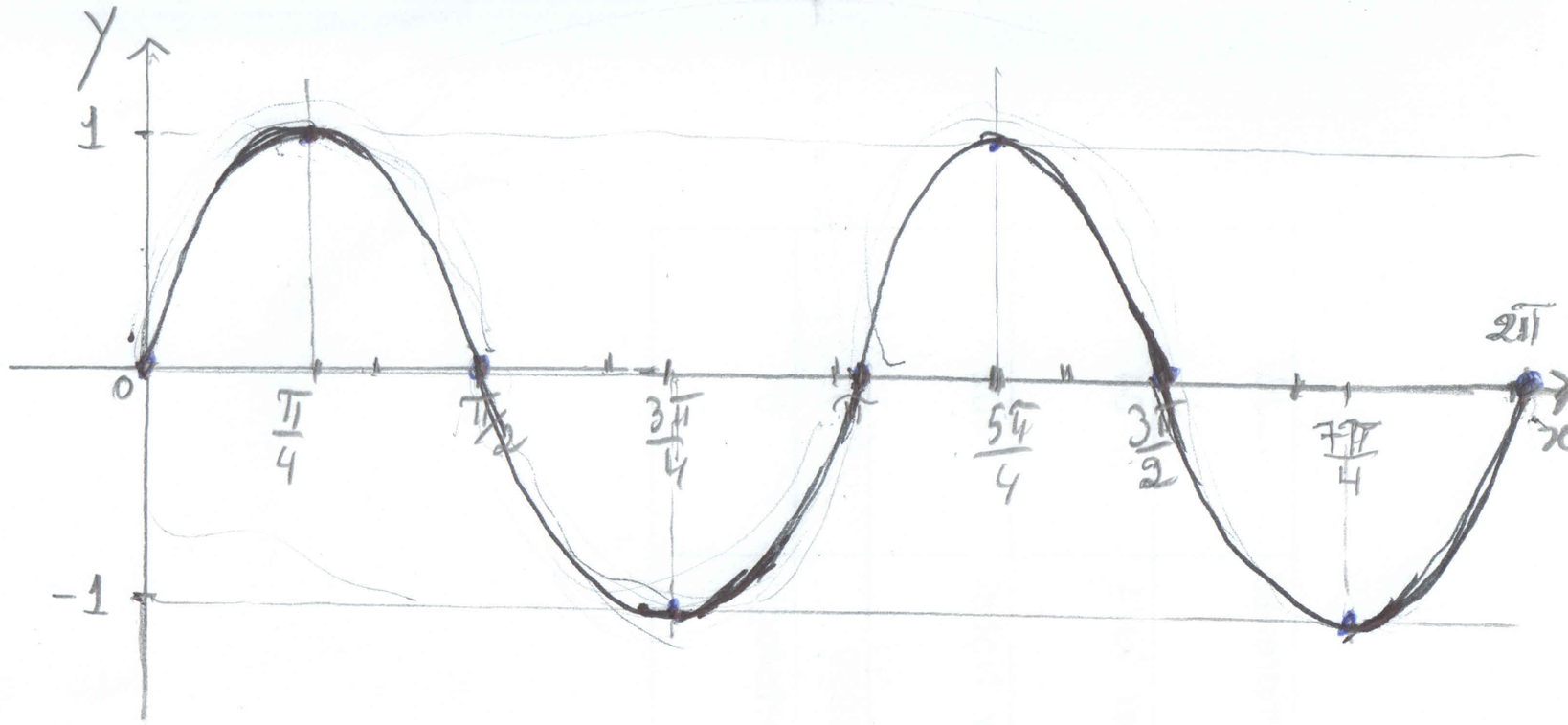
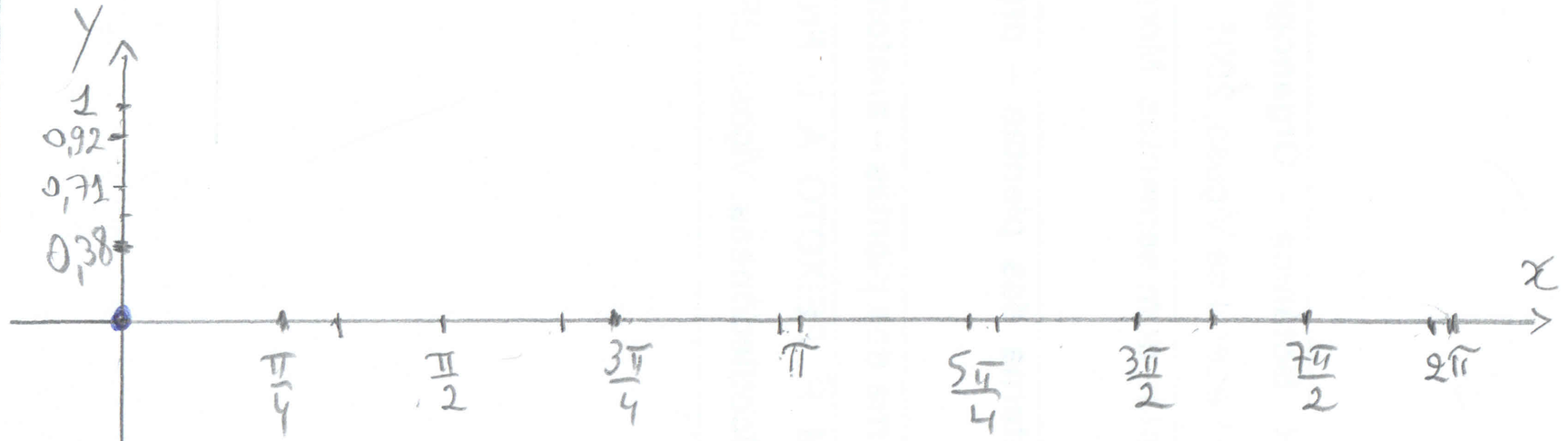
x	$y = \operatorname{sen} x$	$f(x) = \operatorname{sen}(2x)$	$g(x) = \operatorname{sen}\left(\frac{x}{2}\right)$
0	$y = 0$	$f(0) = \operatorname{sen} 0 = 0$	$g(0) = \operatorname{sen}(0) = 0$
$\frac{\pi}{4}$	$y = \frac{\sqrt{2}}{2}$	$f\left(\frac{\pi}{4}\right) = \operatorname{sen}\left(\frac{\pi}{2}\right) = 1$	$g\left(\frac{\pi}{4}\right) = \operatorname{sen}\left(\frac{\pi}{8}\right) \approx 0{,}38$
$\frac{\pi}{2}$	$y = 1$	$f\left(\frac{\pi}{2}\right) = \operatorname{sen} \pi = 0$	$g\left(\frac{\pi}{2}\right) = \operatorname{sen}\left(\frac{\pi}{4}\right) \approx 0{,}71$
$\frac{3\pi}{4}$	$y = \frac{\sqrt{2}}{2}$	$f\left(\frac{3\pi}{4}\right) = \operatorname{sen}\left(\frac{3\pi}{2}\right) = -1$	$g\left(\frac{3\pi}{4}\right) = \operatorname{sen}\left(\frac{3\pi}{8}\right) \approx 0{,}92$
π	$y = 0$	$f(\pi) = \operatorname{sen}(2\pi) = 0$	$g(\pi) = \operatorname{sen}\left(\frac{\pi}{2}\right) = 1$
$\frac{5\pi}{4}$	$y = -\frac{\sqrt{2}}{2}$	$f\left(\frac{5\pi}{4}\right) = \operatorname{sen}\left(\frac{5\pi}{2}\right) = 1$	$g\left(\frac{5\pi}{4}\right) = \operatorname{sen}\left(\frac{5\pi}{8}\right) \approx 0{,}92$
$\frac{3\pi}{2}$	$y = -1$	$f\left(\frac{3\pi}{2}\right) = \operatorname{sen}(3\pi) = 0$	$g\left(\frac{3\pi}{2}\right) = \operatorname{sen}\left(\frac{3\pi}{4}\right) \approx 0{,}71$
$\frac{7\pi}{4}$	$y = -\frac{\sqrt{2}}{2}$	$f\left(\frac{7\pi}{4}\right) = \operatorname{sen}\left(\frac{7\pi}{2}\right) = -1$	$g\left(\frac{7\pi}{4}\right) = \operatorname{sen}\left(\frac{7\pi}{8}\right) \approx 0{,}38$
2π	$y = 0$	$f(2\pi) = \operatorname{sen}(4\pi) = 0$	$g(2\pi) = \operatorname{sen}(\pi) = 0$
			$g(3\pi) = \operatorname{sen}\left(\frac{3\pi}{2}\right) = -1$
			$g(4\pi) = \operatorname{sen}(2\pi) = 0$



$(0,0)$; $\left(\frac{\pi}{4}, 1\right)$; $\left(\frac{\pi}{2}, 0\right)$; $(\pi; 0)$; $\left(\frac{5\pi}{4}; 1\right)$; $\left(\frac{3\pi}{2}, 0\right)$; $\left(\frac{7\pi}{4}, -1\right)$ e $(2\pi, 0)$; $\left(\frac{3\pi}{4}; -1\right)$

Período $= \pi$ $\quad D(f) = \mathbb{R}$ $\quad Im(f) = [-1, 1]$



$\overset{\div 2}{2} \cdot \frac{\pi}{\underset{\div 2}{4}} = \frac{\pi}{2}$ $\quad \cancel{2} \cdot \frac{3\pi}{\cancel{4}_2} = \frac{3\pi}{2}$

$\cancel{2} \cdot \frac{\pi}{\cancel{2}} = \pi$ $\quad \cancel{2} \cdot \frac{3\pi}{\cancel{2}} = 3\pi$

$\overset{\div 2}{2} \cdot \frac{7\pi}{\underset{\div 2}{4}} = \frac{7\pi}{2}$

$3\pi \div 2 = \frac{3\pi}{2}$

$4\pi \div 2$

$0 \div 2 = 0$

$\frac{\pi}{4} \div 2 = \frac{\pi}{4} \cdot \frac{1}{2} = \frac{\pi}{8}$

$\frac{\pi}{2} \div 2 = \frac{\pi}{4}$

$\frac{3\pi}{4} \div 2 = \frac{3\pi}{8}$

$\pi \div 2 = \frac{\pi}{2}$

$\frac{5\pi}{4} \div 2 = \frac{5\pi}{8}$

$\frac{3\pi}{2} \div 2 = \frac{3\pi}{4}$

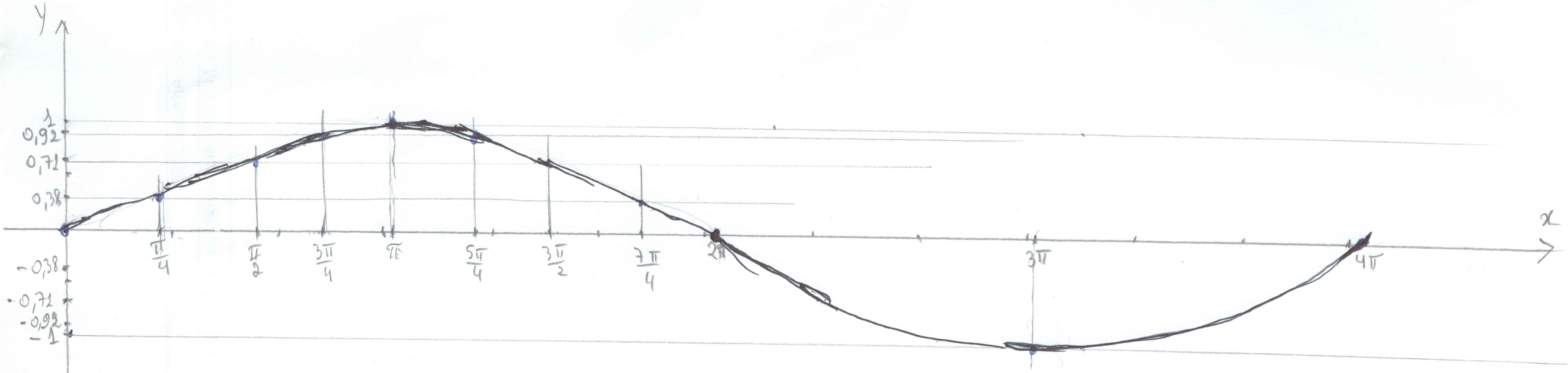
$\frac{7\pi}{4} \div 2 = \frac{7\pi}{8}$

$2\pi \div 2 = \pi$

$(0,0)$; $\left(\frac{\pi}{4}, 0{,}38\right)$; $\left(\frac{\pi}{2}, 0{,}72\right)$; $\left(\frac{3\pi}{4}, 0{,}92\right)$

$(\pi, 1)$; $\left(\frac{5\pi}{4}, 0{,}92\right)$; $\left(\frac{3\pi}{2}, 0{,}72\right)$

$\left(\frac{7\pi}{4}, 0{,}38\right)$; $(2\pi, 0)$.

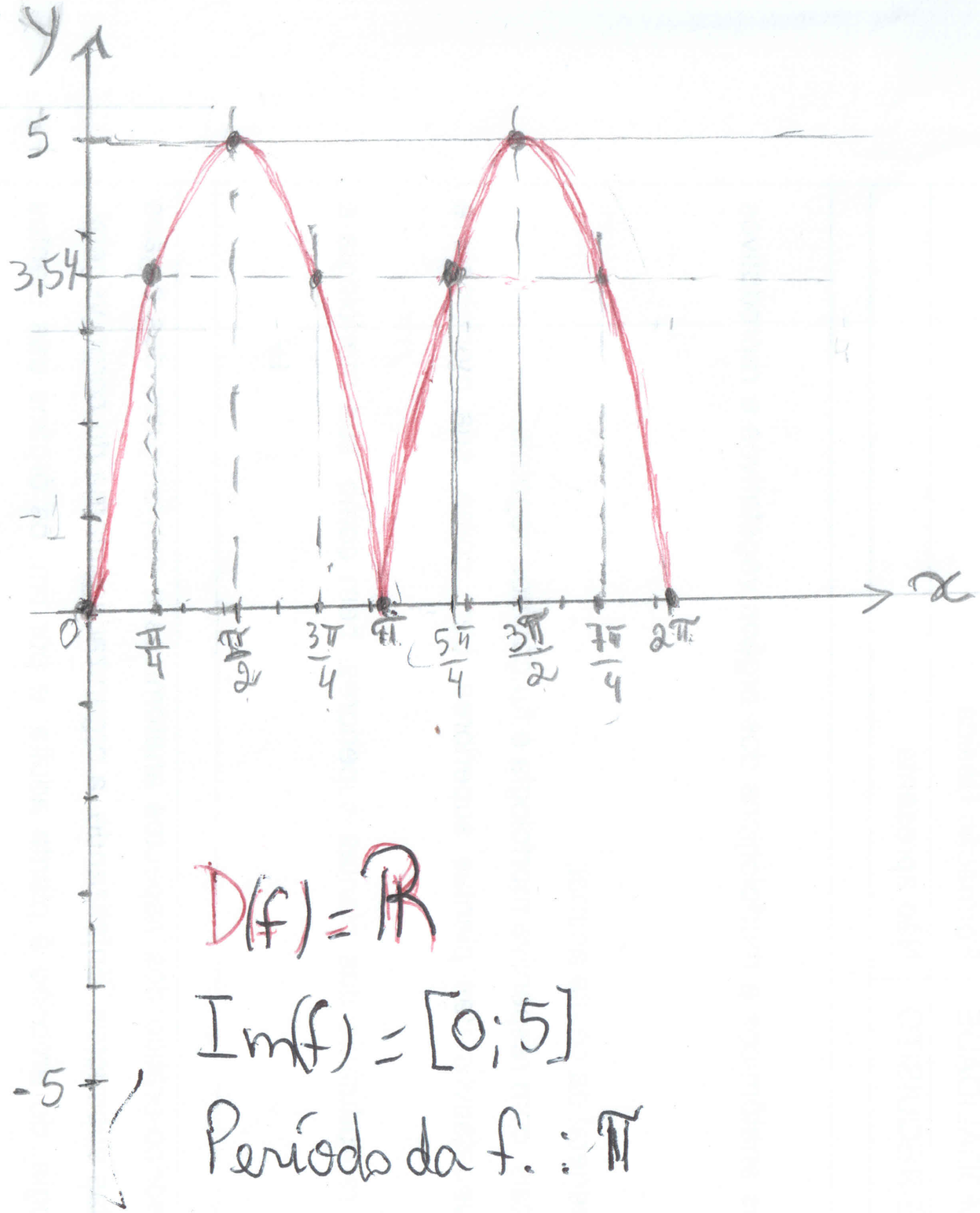


Período de $g = 4\pi$

$D(g) = \mathbb{R}$

$Im(g) = [-1, 1]$

x	$y = \operatorname{sen} x$	$f(x) = \lvert 5 \cdot \operatorname{sen} x \rvert$
0	$y = 0$	$f(0) = \lvert 5 \cdot 0 \rvert = \lvert 0 \rvert = 0$
$\frac{\pi}{4}$	$y = \frac{\sqrt{2}}{2}$	$f(\frac{\pi}{4}) = \lvert 5 \cdot \frac{\sqrt{2}}{2} \rvert \approx \lvert 3{,}54 \rvert \approx 3{,}54$
$\frac{\pi}{2}$	$y = 1$	$f(\frac{\pi}{2}) = \lvert 5 \cdot 1 \rvert = \lvert 5 \rvert = 5$
$\frac{3\pi}{4}$	$y = \frac{\sqrt{2}}{2}$	$f(\frac{3\pi}{2}) = \lvert 5 \cdot \frac{\sqrt{2}}{2} \rvert \approx 3{,}54$
π	$y = 0$	$f(\pi) = \lvert 5 \cdot 0 \rvert = 0$
$\frac{5\pi}{4}$	$y = -\frac{\sqrt{2}}{2}$	$f(\frac{5\pi}{4}) = \lvert 5 \cdot (-\frac{\sqrt{2}}{2}) \rvert \approx \lvert -3{,}54 \rvert \approx 3{,}54$
$\frac{3\pi}{2}$	$y = -1$	$f(\frac{3\pi}{2}) = \lvert 5 \cdot (-1) \rvert = \lvert -5 \rvert = 5$
$\frac{7\pi}{4}$	$y = -\frac{\sqrt{2}}{2}$	$f(\frac{7\pi}{4}) = \lvert 5 \cdot (-\frac{\sqrt{2}}{2}) \rvert \approx 3{,}54$
2π	$y = 0$	$f(2\pi) = \lvert 5 \cdot 0 \rvert = 0$



$D(f) = \mathbb{R}$

$Im(f) = [0; 5]$

Período da f.: π

$(0,0)$; $(\frac{\pi}{4}, 3{,}54)$; $(\frac{\pi}{2}, 5)$; $(\frac{3\pi}{4}; 3{,}54)$;

$(\pi, 0)$; $(\frac{5\pi}{4}; 3{,}54)$; $(\frac{3\pi}{2}; 5)$; $(\frac{7\pi}{4}; 3{,}54)$;

$(2\pi; 0)$