cálculo 1, stewart, vol 1, ed5, cap 4.5

1. $f(x) = x^3 + x$

1. $D = \mathbb{R}$ 2. $f(0) = 0$ 3. sem assintotas horiz. e verti.

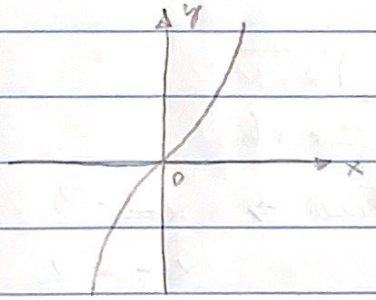
4. $f'(x) = 3x^2 + 1$

$3x^2 + 1 = 0$ não existe x que satisfaça

5. $f''(x) = 6x$ $f''(x) = 0$ quando $x = 0$

6.

x	f	f'	f''	
$x < 0$	$\ominus$	$\oplus$	$\ominus$	crescente, C.B
$x = 0$	0		0	ponto de inflexão, raiz (0,0)
$x > 0$	$\oplus$	$\oplus$	$\oplus$	crescente, C.C



13 $f(x) = \frac{x}{x^2 - 9}$

1 $D = \{x \in \mathbb{R} \mid x \neq \pm 3\}$

2 $f(0) = 0/-9 = 0$, (0,0)

3 $\lim_{x \to \infty} \frac{x}{x^2-9} = +\infty$ $\lim_{x \to -\infty} \frac{x}{x^2-9} = -\infty$ sem assíntotas hori.

4 $\lim_{x \to 3^-} \frac{x}{x^2-9} = -\infty$ $\lim_{x \to 3^+} \frac{x}{x^2-9} = +\infty$ $x = 3$ e $x = -3$

33 $f(x) = x \operatorname{tg} x \qquad -\pi/2 < x < \pi/2$

1. $D = \{ x \in \mathbb{R} \mid -\frac{\pi}{2} < x < \frac{\pi}{2} \}$

2. $f(0) = 0 \cdot \operatorname{tg} 0 = 0 \qquad (0,0)$

3. assíntotas horizontais ✱ sem

4. assíntotas verticais ✱ nenhuma no domínio, mas

$\lim_{x \to -\frac{\pi}{2}^-} x \operatorname{tg} x = +\infty \qquad \lim_{x \to \frac{\pi}{2}^+} x \operatorname{tg} x = +\infty \qquad x = \frac{\pi}{2} \qquad x = -\frac{\pi}{2}$

5. $f'(x) = 1 \cdot \operatorname{tg}(x) + x \cdot \left[\frac{\operatorname{sen}(x)}{\cos(x)}\right]' = \operatorname{tg}(x) + x \cdot \sec^2 x$

$x' = 0$ em $x = 0$

6. $f'' = \sec^2 x + (\sec^2 x + x \cdot [\sec^2 x]')$

$= \sec^2 x + (\sec^2 x + x \cdot \sec x \cdot \operatorname{tg} x)$

$= 2\sec^2 x + x \sec \cdot \operatorname{tg}$ minha é $= 0$, sem pontos de inflexão

7.

x	f	f'	f''	
$x = -\frac{\pi}{2}$				
$-\frac{\pi}{2} < x < 0$		$\ominus$	$\oplus$	decrescente, C. C.
$x = 0$	0			raiz $(0,0)$
$0 < x < \frac{\pi}{2}$		$\oplus$	$\oplus$	crescente, C. C.
$x = \frac{\pi}{2}$