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Revisão

1)

a) $\begin{cases} \frac{\text{Sen } x}{x} & x \neq 0 \\ 0, & x = 0 \end{cases}$ em $x = 0$ $\left.\begin{matrix} 0 \\ 0 \end{matrix}\right\}$ continua

b) $x - |x|$, $x = 0$ $0 - 0 = 0$ Continua

c) $\begin{cases} \frac{x^3 - 8}{x^2 - 4}, & x \neq \\ 3 & , x = 2 \end{cases}$ em $x = 2$ $\frac{\cancel{(x-2)}(x^2 + 2x + 4)}{\cancel{(x-2)}(x+2)}$

$\frac{2^2 + 2.2 + 4}{2+2} = \frac{4+4+4}{4} = \frac{12}{4} = 3$

$3 \neq 2$ Descontínua

d) $\begin{cases} x^2 \text{ sen } 1/x, & x \neq 0 \\ 0, & x = 0 \end{cases}$ $\begin{matrix} 0 \\ 0 \end{matrix}$ $0 = 0$ Contínua

Trocadas

e) $\frac{1}{\text{sen } \frac{1}{x}}$ $\frac{1}{\text{sen}\left(\frac{1}{2}\right)} = \cos\left(\frac{1}{2}\right) = 2$ Contínua

f) $\begin{cases} 1 - x^2, & x < 1 \\ 1 - |x| & x > 1 \\ 1 & x = 1 \end{cases}$ em $x = 1$ $\begin{matrix} 1 - 1 = 0 \\ 1 - 1 = 0 \\ 1 \end{matrix}$ Descontínua

g) $\begin{cases} \frac{x^2-4}{x-2} & x \neq 2 \\ 0 & x = 2 \end{cases}$ $\quad \frac{(x+2)\cancel{(x-2)}}{\cancel{x-2}} (x+2) = 2+2 = 4$

$4 \neq 0$ Descontínua

h) $\begin{cases} x^2 & x \geq -1 \\ 1-|x| & x < -1 \end{cases}$ em $x=-1$ $\quad \frac{1}{0}$ Descontínua

i) $\frac{x^2-3x+7}{x^2+1} = \frac{2^2-3.2+7}{2^2+1} = \frac{4-6+7}{5} = \frac{5}{5} = 1$

j) $\frac{2}{3x^2+x^3-x-3} = \frac{2}{3.(-3)^2+(-3)^3-(-3)-3} = \frac{2}{3.9+(-27)\cancel{+3}-3}$

$\frac{\cancel{2}}{0}$

2)

a) $\lim_{x \to 1} (4x^2-7x+5) = \lim_{x \to 1} 4x^2 - \lim_{x \to 1} 7x + \lim_{x \to 1} 5$

$4.1^2-7.1+5 = 2$

b) $\lim_{x \to -3} \frac{x^2+2x-3}{5-3x} = \frac{-3^2+2.-3-3}{5-3.-3} = \frac{9-6-3}{14} = \frac{0}{14} = 0$

c) $\lim_{x \to 2} \left(\frac{3x^2-2x-5}{-x^2+3x+4}\right)^3 = \left(\frac{3.2^2-2.2-5}{-2^2+3.2+4}\right)^3 = \left(\frac{12-4-5}{-4+6+4}\right)^3 =$

$\frac{1}{8}$

d) $\lim_{x \to -1} \sqrt{\frac{2x^2+3x-3}{5x-4}} = \sqrt{\frac{2 \cdot -1 + 3 \cdot -1 - 3}{5(-1)-4}} = \sqrt{\frac{2-3+3}{+9}} = \sqrt{\frac{+4}{+9}}$

$\frac{2}{3}$

e) $\lim_{x \to -2} \sqrt[3]{\frac{3x^3-5x^2-x+3}{4x+3}} = \sqrt[3]{\frac{3(-2)^3-5(-2)^2-(-2)+3}{4(-2)+3}}$

$\sqrt[3]{\frac{3 \cdot -8 - 5 \cdot 4 + 5}{-5}} = \sqrt[3]{\frac{-24 - 20 + 5}{-5}} \sqrt[3]{\frac{-39}{-5}}$

f) $\lim_{x \to 2} \frac{\sqrt{2x^2+3x+2}}{6-4x} = \frac{\sqrt{2 \cdot 2^2 + 3 \cdot 2 + 2}}{6 - 4 \cdot 2} = \frac{4}{-2} = -2$

g) $\lim_{x \to 0} (3-7x-5x^2) = 3-0-0 = 3$

H) $\lim_{x \to -3} (3x^2-7x+2) = 3(-3)^2-7(-3)+2 = 50$

i) $\lim_{x \to -1} \left((x+4)^3 (x+2)^{-1} \right) = (-1+4)^3 (-1+2)^{-1} =$

$27 \cdot 1 = 27$

j) $\lim_{x \to 0} ((x-2)^{10} \cdot (x+4))$

$(0-2)^{10} (0+4) = 4092+4 = 4096$

k) $\lim_{s \to \frac{1}{2}} \frac{s+4}{2s} = \frac{\frac{1}{2} + \frac{4}{4}}{2 \cdot \frac{1}{2}} = \frac{\frac{1+8}{2}}{\frac{2}{2}} = \frac{\frac{9}{2}}{\frac{2}{2}} = \frac{9}{2}$

1) $\lim\limits_{t\to 2} \frac{t^2+5t+6}{t+2} = \frac{2^2+5\cdot 2+6}{2+2} = 5$

3)

3) $\lim\limits_{x\to+\infty} (3x^3+4x^2-1) = +\infty +\infty -1 = +\infty$

4) $\lim\limits_{x\to+\infty} \left(2-\frac{1}{x}+\frac{4}{x^2}\right) = 2-0+4\cdot 0 = 2\infty$

5) $\lim\limits_{t\to+\infty} \frac{t+1}{t^2+1} = \frac{\cancel{t^2}\left(\frac{1}{t}+\frac{1}{t^2}\right)}{\cancel{t^2}\left(1+\frac{1}{t^2}\right)} = \frac{0+0}{1+0} = 0$

6) $\lim\limits_{t\to-\infty} \frac{t+1}{t^2+1} = \frac{\cancel{t^2}\left(\frac{1}{t}+\frac{1}{t^2}\right)}{t^2\left(1+\frac{1}{t^2}\right)} = \frac{0+0}{1+0} = 0$

7) $\lim\limits_{t\to+\infty} \frac{t^2-2t+3}{2t^2+5t-3} = \frac{\cancel{t^2}\left(1-\frac{2}{t}+\frac{3}{t^2}\right)}{t^2\left(2+\frac{5}{t}-\frac{3}{t^2}\right)} = \frac{1-2\cdot0+3\cdot0}{2+5\cdot0-3\cdot0} = \frac{1}{2}$

8) $\lim\limits_{x\to+\infty} \frac{2x^5-3x^3+2}{-x^2+7} = \frac{\cancel{x^2}\left(2x^3-3x+\frac{3}{x^2}\right)}{\cancel{x^2}\left(-1+\frac{7}{x^2}\right)} = \frac{+\infty}{-1} = -\infty$

9) $\lim\limits_{x\to-1} \frac{3x^5-x^2+7}{2-x^2} = \frac{\cancel{x^2}\left(3x^3-1+\frac{7}{x^2}\right)}{\cancel{x^2}\left(\frac{2}{x^2}-1\right)} = \frac{-\infty}{-1} = +\infty$

10) $\lim\limits_{x\to-\infty} \frac{-5x^3+2}{7x^3+3} = \frac{\cancel{x^3}\left(-5+\frac{2}{x^3}\right)}{\cancel{x^3}\left(7+\frac{3}{x^3}\right)} = \frac{-5-2\cdot0}{7+3\cdot0} = -\frac{5}{7}$

4)

a) $\lim_{x \to 0} \frac{sen\,9x}{x} = \frac{sen\,9x}{x} \cdot \frac{9}{9} = \frac{9\,sen\,9x}{9x}$ $\quad t = 9x$

$9 \cdot \frac{sen\,t}{t} = 9 \cdot 1 = 9$

b) $\lim_{x \to 0} \frac{sen\,4x}{3x} = \frac{4\cos(4.0)}{3} = \frac{4}{3}$

c) $\lim_{x \to 0} \frac{sen\,10x}{sen\,7x} = \frac{sen\,10x}{sen\,7x} \cdot \frac{10.7x}{10.7x} =$

$\frac{10}{7} \cdot \frac{sen\,10x}{10x} \cdot \frac{7x}{sen\,7x} = \frac{10}{7} \cdot 1 \cdot 1^{-1} = \frac{10}{7}$

d) $\lim_{x \to 0} \frac{tg\,x}{x} = \left(\frac{\frac{sen\,x}{\cos x}}{x}\right) = \left(\frac{sen\,x}{\cos x \cdot x}\right) =$

$\frac{1}{\cos x} \cdot \frac{sen\,x}{1} = \frac{1}{\cos(0)} \cdot 1 = 1$

e) $\lim_{x \to 0} \frac{sen\,2x}{x} = \frac{sen\,2x}{x} \cdot \frac{2}{2} = \frac{2 \cdot sen\,2x}{2x} = 2$

f) $\lim_{x \to 0} \frac{sen\,3x}{sen\,5x} = \left(\frac{sen\,3x}{sen\,5x} \cdot \frac{3.5x}{3.5x}\right)$

$\frac{3}{5} \cdot \frac{sen\,3x}{3x} \cdot \frac{5x}{sen\,5x} = \frac{3}{5} \cdot 1 \cdot 1^{-1} = \frac{3}{5}$