

ESCOLA SUPERIOR DE AGRICULTURA “LUIZ DE QUEIROZ”
UNIVERSIDADE DE SÃO PAULO
DEPARTAMENTO DE CIÊNCIAS EXATAS
LCE0130 - CÁLCULO DIFERENCIAL E INTEGRAL

RESPOSTAS - EXERCÍCIOS DO SLIDE(AULA 4)

Slide 8 - a) $\lim_{x \rightarrow 1^+} (-2x + 4) = -2 + 4 = 2$

$$\lim_{x \rightarrow 1^-} (x + 1) = 1 + 1 = 2$$

Portanto $\lim_{x \rightarrow 1} f(x) = 2$

b) $\lim_{x \rightarrow 1^+} (7 - 2x) = 7 - 2 = 5$

$$\lim_{x \rightarrow 1^-} (2x + 3) = 2 + 3 = 5$$

Portanto $\lim_{x \rightarrow 1} f(x) = 5$

c) $\lim_{x \rightarrow 2^+} (8 - 2x) = 8 - 4 = 4$

$$\lim_{x \rightarrow 2^-} x^2 = 2^2 = 4$$

Portanto $\lim_{x \rightarrow 1} f(x) = 4$

Slide 11 -

$$\lim_{x \rightarrow -\infty} \frac{2x+1}{5x+2} = \lim_{x \rightarrow +\infty} \frac{2x+1}{5x+2} = \lim_{x \rightarrow +\infty} \frac{\frac{2x+1}{x}}{\frac{5x+2}{x}} = \lim_{x \rightarrow +\infty} \frac{2 + \frac{1}{x}}{5 + \frac{2}{x}} = \frac{2}{5}$$

Slide 23 - a) $\lim_{x \rightarrow +\infty} \frac{3+5x^3}{x^3} = \lim_{x \rightarrow +\infty} \frac{\frac{3+5x^3}{x^3}}{\frac{x^3}{x^3}} = \lim_{x \rightarrow +\infty} \frac{5 + \frac{3}{x^3}}{1} = 5$

b) $\lim_{x \rightarrow -\infty} \frac{x^3+1}{x^4+5x^3+x+2} = \lim_{x \rightarrow -\infty} \frac{\frac{x^3+1}{x^3}}{\frac{x^4+5x^3+x+2}{x^3}} = \lim_{x \rightarrow -\infty} \frac{1 + \frac{1}{x^3}}{x + 5 + \frac{1}{x^2} + \frac{2}{x^3}} = 0$

c) $\lim_{x \rightarrow -\infty} \frac{2x+3}{3x+2} = \lim_{x \rightarrow -\infty} \frac{\frac{2x+3}{x}}{\frac{3x+2}{x}} = \lim_{x \rightarrow -\infty} \frac{2 + \frac{3}{x}}{3 + \frac{2}{x}} = \frac{2}{3}$

d) $\lim_{x \rightarrow +\infty} \frac{x}{x-1} = \lim_{x \rightarrow +\infty} \frac{\frac{x}{x-1}}{\frac{x-1}{x-1}} = \lim_{x \rightarrow +\infty} \frac{1}{1 - \frac{1}{x}} = 1$

e) $\lim_{x \rightarrow -\infty} \frac{x^{100} + x^{99}}{x^{101} - x^{100}} = \lim_{x \rightarrow -\infty} \frac{\frac{x^{100} + x^{99}}{x^{101}}}{\frac{x^{101} - x^{100}}{x^{101}}} = \lim_{x \rightarrow -\infty} \frac{1 + \frac{1}{x}}{x - 1} = 0$