# Exercícios de Matemática 1 – Limites 0/0

$(a+b)^4 = a^4 + 4a^3b + 6a^2b^2 + 4ab^3 + b^4$

data fecha

D S T Q Q S S
D L M M J V S

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f) $\lim_{x \to 2} \frac{x^2-5x+6}{x^2-12x+20} = \frac{2^2-5.2+6}{2^2-12.2+20} = \frac{0}{0}$

$\lim_{x \to 2} \frac{(x-2)(x-3)}{(x-2)(x-10)} = \lim_{x \to 2} \frac{(x-3)}{x-10} = \frac{(2-3)}{(2-10} = \frac{-1}{-8} = \frac{1}{8}$

$\lim_{x \to 2} \frac{x^2-5x+6}{x^2-12x+2} = \frac{1}{8}$

g) $\lim_{h \to 0} \frac{(2-h)^4-16}{h} = \frac{(2+0)^4-16}{0} = \frac{16-16}{0} = \frac{0}{0}$

$\lim_{h \to 0} \frac{2^4+4\,2^3 h+6\,2^2 h^2+4\,2h^3+h^4}{h}$

$\lim_{h \to 0} \frac{\cancel{16}+32h+24h^2+8h^3+h^4-\cancel{16}}{h} =$

$\lim_{h \to 0} \frac{\cancel{h}(32+24h+8h^2+h^3)}{\cancel{h}} = 32+24h+8h^2+h^3 =$

$32+\cancel{24.0}+\cancel{8.0^2}+\cancel{0^3} = 32$

$\lim_{h \to 0} \frac{(2+h)^4-16}{h} = 32$

h) $\lim\limits_{t \to 0} \frac{\sqrt{25+3t}-5}{t} = \frac{\sqrt{25+3.0}-5}{0} = \frac{5-5}{0} = \frac{0}{0}$

$\lim\limits_{t \to 0} \frac{\sqrt{25+3t}-5}{t} \cdot \frac{(\sqrt{25+3t}-5)}{(\sqrt{25+3t}-5)} =$

$\lim\limits_{t \to 0} \frac{25+3t-25}{t(\sqrt{25+3t}+5} = \lim\limits_{x \to 0} \frac{3.t}{t(\sqrt{25+3t}+5)} = \lim \frac{3}{\sqrt{25+3t}+5}$

$\lim\limits_{x \to 0} \frac{3}{\sqrt{25+30}+5} = \frac{3}{5+5} = \frac{3}{10}$

$\lim\limits_{t \to 0} \frac{\sqrt{25+3t}}{t} = \frac{3}{10}$

i) $\lim\limits_{x \to 0} \frac{\sqrt{1+x}-1}{-x} = \frac{\sqrt{1+0}-1}{-0} = \frac{\sqrt{1}-1}{0} = \frac{0}{0}$

$\lim\limits_{x \to 0} \frac{\sqrt{1+x}-1}{-x} \cdot \frac{(\sqrt{1+x}+1)}{(\sqrt{1+x}+1)} =$

$\lim\limits_{x \to 0} \frac{\sqrt{1^2+x^2}-1^2}{-x(\sqrt{1+x}+1} = \lim\limits_{x \to 0} \frac{1+x-1}{-x(\sqrt{1+x}+1)}$

$\lim\limits_{x \to 0} \frac{\cancel{x}}{-\cancel{x}(\sqrt{x+1}+1} = \lim\limits_{x \to 0} \frac{-1}{(\sqrt{x+1}+1}$

$\frac{-1}{\sqrt{0+1}+1} = \frac{-1}{\sqrt{1}+1} = \frac{-1}{1+1} = \frac{-1}{2}$

j) $\lim_{x \to 0} \frac{\sqrt{x+2} - \sqrt{2}}{x} = \frac{\sqrt{0+2} - \sqrt{2}}{0} =$

$\frac{\sqrt{2} - \sqrt{2}}{0} = \frac{0}{0}$

$\lim_{x \to 0} \frac{(\sqrt{x+2} - \sqrt{2})}{x} \cdot \frac{(\sqrt{x+2} + \sqrt{2})}{(\sqrt{x+2} + \sqrt{2})} =$

$\lim_{x \to 0} \frac{(\sqrt{x+2})^2 - (\sqrt{2})^2}{x(\sqrt{x+2}) + \sqrt{2})} =$

$\lim_{x \to 0} \frac{x+2-2}{x(\sqrt{x+2} + \sqrt{2}} = \lim_{x \to 0} \frac{x}{x(\sqrt{x+2} + \sqrt{2})} =$

$\lim_{x \to 0} \frac{1}{\sqrt{x+2} + \sqrt{2}} = \frac{1}{\sqrt{0+2} + \sqrt{2}} = \frac{1}{\sqrt{2} + \sqrt{2}} =$

$\frac{1}{2\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}}{4} \therefore \lim \frac{\sqrt{x+2} - \sqrt{2}}{x} = \frac{\sqrt{2}}{4}$