Cálculo II

a - $\lim\limits_{(x,y) \to (3,2)} (x^2 y^3 - 4y^2)$

$\lim\limits_{x \to 3} \lim\limits_{y \to 2} (x^2 y^3 - 4y^2) = \lim\limits_{x \to 3} 8x^2 - 16 = 56$

$\lim\limits_{x \to 3} \lim\limits_{y \to 2} (x^0 y^3 - 4y^2) = \lim\limits_{y \to 2} 9y^3 - 4y^2 = 56$

$\lim = 56$ //

b - $\lim\limits_{(x,y) \to (2,-1)} \dfrac{x^2 y + xy^2}{x^2 - y^2}$

$\lim\limits_{x \to 2} \lim\limits_{y = -1} \dfrac{x^2 y + xy^2}{x^2 - y^2} = \lim\limits_{x \to 2} \dfrac{-x^2 + x}{x^2 - 1} = -2/3$

$\lim\limits_{x \to 2} \lim\limits_{y = -1} \dfrac{x^2 y + xy^2}{x^2 - y^2} = \lim\limits_{y = -1} \dfrac{4y + 2y^2}{4 - y^2} = -2/3$

$\lim = -2/3$ //

c - $\lim\limits_{(x,y) \to (0,0)} \dfrac{x^4 - 4y^2}{x^2 - 2y^2}$

$\lim\limits_{x \to 0} \lim\limits_{y \to 0} \dfrac{x^4 - 4y^2}{x^2 - 2y^2} = \lim\limits_{x \to 0} \dfrac{x^4}{x^2} = 0$

$\lim\limits_{x \to 0} \lim\limits_{y \to 0} \dfrac{x^4 - 4y^2}{x^2 - 2y^2} = \lim\limits_{y \to 0} \dfrac{-2y^2}{y^2} = -2$

$\lim$ DIFERENTES, OU SEJA, DIVERGENTE, PORTANTO NÃO EXISTE

d - $\lim\limits_{(x,y) \to (0,0)} \dfrac{x^2 + \sin^2(y)}{2x^2 + y^2}$

$\lim\limits_{x \to 0} \lim\limits_{y \to 0} \dfrac{x^2 + \text{sen}^2(y)}{2x^2 + y^2} = \lim\limits_{x \to 0} \dfrac{x^2}{2x^2} = \dfrac{1}{2}$

$\lim\limits_{x \to 0} \lim\limits_{y \to 0} \dfrac{x^2 + \text{sen}^2(y)}{2x^2 + y^2} = \lim\limits_{y \to 0} \left(\dfrac{\text{sen}(y)}{y}\right)^2 = 1$

$\lim$ DIFERENTES, NÃO EXISTE