3) I) $\lim_{x \to 2} \frac{x^2 - 2x}{x^3 - 2x^2 + x - 2}$

$\lim_{x \to 2} \frac{2^2 - 2x}{2^3 - 2 \cdot 2^2 + 2 - 2} = \lim_{x \to 2} \left(\frac{x}{x^2 + 1} \right) = \lim_{1 \to 0} \frac{2}{2^2 + 1} = \boxed{\frac{2}{5}}$

II) $\lim_{x \to 3} \frac{\sqrt{5x + 10} - 2}{x - 3}$ $\lim_{x \to 3^+} \left(\frac{\sqrt{5x + 10} - 2}{x - 3} \right) = \infty$

$\lim_{x \to 3^-} \left(\frac{\sqrt{5x + 10} - 2}{x - 3} \right) = -\infty$

III) $\lim_{x \to +\infty} \left(1 + \frac{3}{x} \right)^x =$

4) $f(x) = \frac{2x^2 + 1}{x^2 - 9}$

$x^2 = 9 \; x = \sqrt{9} = 3 \quad x = \sqrt{3^2} = 3 \quad \boxed{x = 3, \; x = -3}$

$x^2 = -9 \; x = -\sqrt{9} = -3$

VERTICAIS

Horizontais → y: coeficiente principal do Numerador / coeficiente principal do Denominador

$y = \frac{2}{1} \quad y = 2$ Horizontal: $\boxed{y = 2}$

7) III) $\frac{dx}{dx} = (\tan(x^2 - 3x)) + ((2 - 3x^2))$

$\frac{dx}{dx} \; \frac{d}{dx} (\tan(x^2 - 3x)) + \frac{d}{dx} (\ln(2 - 3x^2))$

$\frac{dx}{dx} = \tan(x^2 - 3x) = \sec^2(x^2 - 3x)(2x - 3)$

$\frac{dx}{dx} \cdot (\ln(2 - 3x^2)) = 6x \cot(2 - 3x^2)(2 - 3x^2)$

$= \sec^2(x^2 - 3x)(2x - 3) + 6x \cot(2 - 3x^2)(\csc(2 - 3x^2))$