3.1 Limites

$$\lim_{x \to 2} \frac{1+x^2}{1-x^2} = \frac{-5}{3} = -1{,}667 \tag{1}$$

3.1.1 Limites à esquerda e à direita

$$\lim_{x \to 3^+} \frac{x}{x-3} = \infty$$

$$\lim_{x \to 3^-} \frac{x+1}{(x-3)^3} = \frac{-1}{4} = -0{,}25 \tag{2}$$

3.2 Derivadas

$$f(x) = 2x^2 + 3x$$
$$\frac{\partial f}{\partial x} = 4x + 3$$

$$f(x) = \frac{1}{3-x}$$
$$\frac{\partial f}{\partial x} = \frac{1}{(x-3)^2} \tag{3}$$

3.2.1 Derivadas superiores

$$f(x) = \frac{1}{3-x}$$
$$\frac{\partial^2 f}{\partial x^2} = \frac{-2}{(x-3)^3}$$

$$f(x) = x - \frac{1}{x}$$
$$\frac{\partial^2 f}{\partial x^2} = \frac{-2}{x^3} \tag{4}$$

3.2.2 Derivadas Trigonométricas

$$f(x)=sen(x)$$
$$\frac{\partial f}{\partial x}=\cos(x)$$

$$f(x)=\cos(2x)$$
$$\frac{\partial f}{\partial x}=-2\cdot sen(2x) \tag{5}$$

$$f(x)=\tan(3x+5)$$
$$\frac{\partial f}{\partial x}=3\cdot\tan(3x+5)^2+3$$

3.3 Integrais

$$\int \sqrt{x}(1-x)^2\,\partial x=\frac{2x^{\frac{3}{2}}(15x^2-42x+35)}{105}$$
$$\int \frac{2x^4-3x^3+5}{7x^2}\,\partial x=\frac{-(-4x^4+9x^3+30)}{42x} \tag{6}$$

3.3.1 Integrais trigonométricas

$$\int (\cos(2x))\,\partial x=\frac{sen(2x)}{2}$$

$$\int (sen(3x+2))\,\partial x=\frac{-\cos(3x+2)}{3} \tag{7}$$

$$\int (3\cdot\cos(x\pi)+\cos(3x\pi))\,\partial x=\frac{4(3\cdot sen(x\pi)-sen(x\pi)^3)}{3\pi}$$

3.3.2 Integrais definidas

$$\int_0^2 \frac{2x}{(x-3)^2}\,\partial x=4-\log(9)$$
$$\int_0^1 (1-2x-3x^2)\,\partial x=-1 \tag{8}$$