



Araguatins - TO

# Exercícios sobre Derivadas

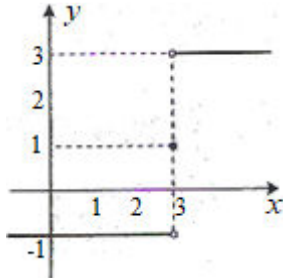
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## Turma 1ª fase de Licenciatura em Ciências Biológicas

### I. DERIVADAS GRAFICAMENTE

Dada  $y = f(x)$  graficamente, responda o que se pede.

1)



a)  $f'(3^-) =$

d)  $f'(1) =$

b)  $f'(3^+) =$

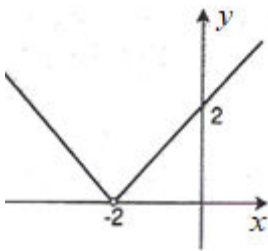
e)  $f'(4) =$

c)  $f'(3) =$

f)  $\lim_{x \rightarrow \infty} f'(x) =$

g)  $f(3) =$

2)



a)  $f'(-2^-) =$

d)  $f'(-3) =$

b)  $f'(-2^+) =$

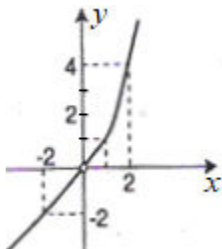
e)  $f'(0) =$

c)  $f'(-2) =$

f)  $\lim_{x \rightarrow -\infty} f'(x) =$

g)  $\lim_{x \rightarrow +\infty} f'(x) =$

3)



a)  $f'(-2^-) =$

d)  $f'(1) =$

b)  $f'(-2^+) =$

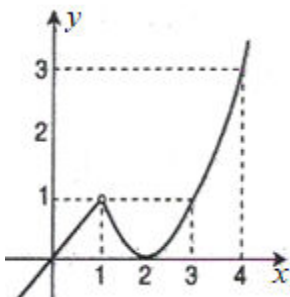
e)  $f'(2) =$

c)  $f'(-2) =$

f)  $\lim_{x \rightarrow -\infty} f'(x) =$

g)  $\lim_{x \rightarrow +\infty} f'(x) =$

4)



a)  $f'(0^-) =$

d)  $f'(1) =$

b)  $f'(0^+) =$

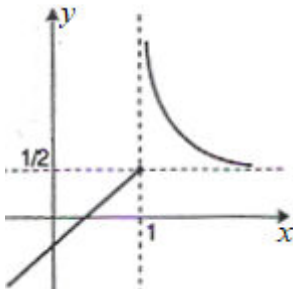
e)  $f'(2) =$

c)  $f'(0) =$

f)  $\lim_{x \rightarrow -\infty} f'(x) =$

g)  $\lim_{x \rightarrow +\infty} f'(x) =$

5)



a)  $f'(1^-) =$

d)  $f'(0) =$

b)  $f'(1^+) =$

e)  $f'(2) =$

c)  $f'(1) =$

f)  $\lim_{x \rightarrow -\infty} f'(x) =$

g)  $\lim_{x \rightarrow +\infty} f'(x) =$

## II. DERIVADAS POR DEFINIÇÃO

Calcule  $f'(x)$  pela definição:

a)  $f(x) = x^2 + x \quad x = 1$     b)  $f(x) = \sqrt{x} \quad x = 4$     c)  $f(x) = 5x - 3 \quad x = -3$   
d)  $f(x) = \frac{1}{x} \quad x = 1$     e)  $f(x) = x^3$     f)  $f(x) = \frac{x}{x+1}$     g)  $f(x) = \sqrt{3x+4}$

## III. REGRAS DE DERIVAÇÃO

Determine a derivada da função indicada:

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

$$f'(x) = -2x^3 + 2x^2 - x$$

2)  $f(x) = x^2 + \sqrt{x}$

$$f'(x) = 2x + \frac{1}{2\sqrt{x}}$$

3)  $f(x) = x^3 \cos x$

$$f'(x) = 3x^2 \cos x - x^3 \operatorname{sen} x$$

4)  $f(x) = x^3(2x^2 - 3x)$

$$f'(x) = 10x^4 - 12x^3$$

5)  $f(x) = \frac{2x+5}{4x}$

$$f'(x) = -\frac{5}{4x^2}$$

6)  $f(x) = \left(\frac{2}{5}\right)^x$

$$f'(x) = \left(\frac{2}{5}\right)^x \ln \frac{2}{5}$$

7)  $f(x) = 2^{3x-1}$

$$f'(x) = 2^{3x-1} \cdot 3 \ln 2$$

8)  $f(x) = 3^x$

$$f'(x) = 3^x \ln 3$$

9)  $f(x) = \operatorname{sen}(x^2)$

$$f'(x) = 2x \cdot \cos(x^2)$$

10)  $f(x) = \cos\left(\frac{1}{x}\right)$

$$f'(x) = \frac{1}{x^2} \operatorname{sen}\left(\frac{1}{x}\right)$$

11)  $f(x) = (x^2 + 5x + 2)^7$

$$f'(x) = 7(x^2 + 5x + 2)^6 (2x + 5)$$

12)  $f(x) = \left(\frac{3x+2}{2x+1}\right)^5$

$$f'(x) = 5 \left(\frac{3x+2}{2x+1}\right)^4 \cdot \frac{-1}{(2x+1)^2}$$

13)  $f(x) = \frac{1}{3}(2x^5 + 6x^{-3})^5$

$$f'(x) = \frac{10}{3}(2x^5 + 6x^{-3})^4 \cdot (5x^4 - 9x^{-4})$$

14)  $y = \ln(x^6 - 1)$

$$y' = \frac{6x^5}{x^6 - 1}$$

15)  $y = \frac{1}{\sqrt[5]{x^3 - 1}}$

$$y' = \frac{3x^2}{5\sqrt[5]{(x^3 - 1)^6}}$$

16)  $y = \cos(x^3 - 4)$

$$y' = -3x^2 \operatorname{sen}(x^3 - 4)$$

17)  $y = (x^3 - 6)^5$

$$y' = 15x^2 (x^3 - 6)^4$$

18)  $y = e^{x^2-3x}$

$$y' = (2x-3) e^{x^2-3x}$$

