

COMPONENTE CURRICULAR:	FUND. MATEMÁTICA
NOME COMPLETO DO ALUNO:	VINÍCIUS VIEIRA UCHITA
RA:	10727953

17/03/25

1) a) $F(x) = x^{10} - 3x^2 + 9x + 2$
 $\mathbb{R} \quad (-\infty, \infty)$

b) $F(x) = \frac{4}{\sqrt{2x-5}}$
 $2x - 5 = 0 \Rightarrow 2x = 5 \Rightarrow \frac{5}{2}$
 $2x - 5 \geq 0 \Rightarrow 2x \geq 5 \Rightarrow x \geq \frac{5}{2}$
 $x = \frac{5}{2} \quad \left(\frac{5}{2}, \infty\right)$

2) a) $F: \mathbb{R} \rightarrow \mathbb{R} \quad (-\infty, \infty)$
b) $F: \mathbb{R} \rightarrow \mathbb{R} \quad (-\infty, \infty)$

c) $y = 3 \quad (x = -4)$
 $y = -3 \quad (x = -2)$
 $y = -1 \quad (x = 2)$
 $y = 1 \quad (x = 4)$
 $y = -3, y = 3 \quad (-3, 3)$
 $[-3, 3]$

d) $x = -4 \quad (x = -2)$
 $x = -2 \quad (x = 0) \quad / \quad y = -3 \quad (y = 2)$
 $x = 0 \quad (x = 2) \quad / \quad y = 2 \quad (y = 1)$
 $x = 2 \quad (x = 4) \quad / \quad y = -1 \quad (y = 1)$
 $x = 4 \quad y = 1$
 $[-2, 0] \quad [2, 4]$

25.03.25

$$\begin{array}{l}
 e) \begin{array}{l} x = -4 \quad (x = -2) \quad | \quad y = 3 \quad (y = -3) \\ x = -2 \quad (x = 0) \quad | \quad y = -1 \quad (y = 1) \\ x = 0 \quad (x = 2) \quad | \quad y = 2 \quad (y = -2) \\ x = 2 \quad (x = 4) \quad | \quad y = -4 \quad (y = 4) \\ x = 4 \quad (x = -4) \quad | \quad y = -2 \quad (y = 2) \end{array} \\
 \cdot \quad \underline{[-4, 2]} \quad \cdot \quad \underline{[-2, 2]}
 \end{array}$$

$$\begin{array}{l}
 f) \quad x = 1: \rightarrow x = -1 \quad | \quad y = -1 \\
 \cdot \quad \underline{F(-1) = -1}
 \end{array}$$

$$\begin{array}{l}
 x = -2: \rightarrow x = -2 \quad | \quad y = -3 \\
 \cdot \quad \underline{F(-2) = -3}
 \end{array}$$

$$\begin{array}{l}
 3) \quad 1. \quad F(1) = 5 \\
 \quad \quad x = 1 \quad F(x) = ax + b: \\
 \quad \quad \quad F(1) = a \cdot 1 + b = a + b = 5 \quad (1)
 \end{array}$$

$$\begin{array}{l}
 2. \quad F\left(\frac{1}{2}\right) = -1 \\
 \quad \quad x = \frac{1}{2} \quad F(x) = ax + b: \\
 \quad \quad \quad F\left(\frac{1}{2}\right) = a \cdot \frac{1}{2} + b = \frac{a}{2} + b = -1
 \end{array}$$

$$\begin{array}{l}
 (1): a + b = 5 \\
 (2): \frac{a}{2} + b = -1
 \end{array}$$

$$(a + b) - \left(\frac{a}{2} + b\right) = 5 - (-1)$$

$$a + b - \frac{a}{2} - b = 5 + 1$$

$$\frac{2a}{2} - \frac{a}{2} = 6$$

$$\frac{a}{2} = 6 \quad a = 12$$

17/03/25

$$a = 12 \quad (1)$$

$$\begin{aligned} 12 + B &= 5 \\ B &= 5 - 12 \\ B &= -7 \end{aligned}$$

$$F = (x) \quad 12x - 7$$

$$4) a) H(g(x)) = (2x^4 - 4x^3 + 2x^2) + (-3x^2 + 3x) + 8$$

$$x^4: 2x^4$$

$$x^3: -4x^3$$

$$x^2: 2x^2 - 3x^2 = -x^2$$

$$(x): (3x)$$

$$= F \circ g = 2x^4 - 4x^3 - x^2 + 3x + 8$$

$$B) (F \circ F)$$

$$(F(F(x))) = F(x) = 2x^2 + 3x + 8$$

$$F(F(x)) = F(2x^2 + 3x + 8)$$

$$2x^2 + 3x + 8 = 2x^2 + 3x + 8:$$

$$F(2x^2 + 3x + 8) = 2(2x^2 + 3x + 8)^2 +$$

$$3(2x^2 + 3x + 8) + 8$$

$$(2x^2 + 3x + 8)^2 = (2x^2 + 3x + 8)(2x^2 + 3x + 8)$$

$$= 4x^4 + 12x^3 + 32x^2 + 6x^3 + 18x^2 + 4x + 16x^2 + 24x + 64$$

$$x^4: 4x^4$$

$$x^3: 12x^3 + 6x^3 = 18x^3$$

$$x^2: 32x^2 + 18x^2 + 16x^2 = 66x^2$$

$$(x): 4x + 24x = 28x$$

$$\text{const. } (64)$$

$$(2x^2 + 3x + 8)^2 = 4x^4 + 18x^3 + 66x^2 + 28x + 64$$

25.03.25

X.2

$$= 3(2x^2 + 3x + 8)$$

$$3(2x^2 + 3x + 8) = 6x^2 + 9x + 24$$

Soma

$$F^o F = 8x^4 + 36x^3 + 138x^2 + 153x + 160$$