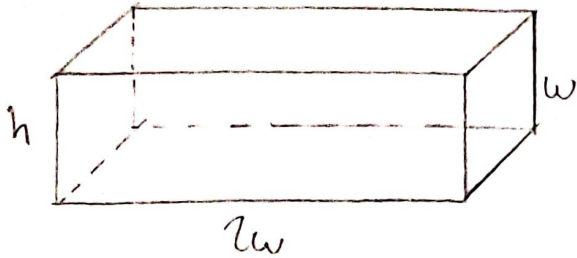Jasser Manzer
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Parcial #3

| # 1 | 1, a |

$$\Leftrightarrow (2w)wh = 2w^2h$$

$$25 = 2w^2h \rightarrow h = \frac{25}{2w^2}$$

$$C(w) = 13(2w^2) + (8)[2(2hw) + 2hw]$$

$$\rightarrow C(w) = 26w^2 + 48hw$$

$$\rightarrow C(w) = 26w^2 + 48\left(\frac{5}{w^2}\right)w$$

$$\rightarrow 26w^2 + 48\left(\frac{25}{2w}\right) = \boxed{26w^2 + 600w^{-1}}$$

$$C'(w) = 26w^2 - 600w = 0$$

$$52w - 600 = 0$$

$$52w = 600$$

$$w = \frac{600}{52} = \boxed{w = 11.5385}$$

$$\boxed{ancho = 11.5385}$$

| # 2 | 1, c |

$$y = \frac{25}{2(11.5385)^2} = 0.0939$$

$$\boxed{altura = 0.0939}$$

| # 3 | 1, b |

$$L = A_b + A_{ancho}$$

$$L = 2(11.5385)^2 + 2[2(11.5385)(0.0939)] + 2(11.5385)(0.0939)$$

$$L = 272.7748$$

$$Longitud = 2$$

| # 4 | 1, d |

$$C = 26(11.5385)^2 + 48(h)(w)$$

$$C = 3513.5679$$

$$\boxed{costo\ mínimo = 3513.5679}$$

$f(x) = x^3 - 3x^2 - 4x + 2 \; ; \; [-1, 1]$

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

a) $f'(c) = \dfrac{F(b) - F(a)}{b - a}$

$\rightarrow f(a) = f(-1) = (-1)^3 - 3(-1)^2 - 4(-1) + 2$

$f(-1) = 2$

$f(b) = F(1) = (1)^3 - 3(1)^2 - 4(1) + 2$

$f(1) = -4$

$f'(c) = \dfrac{-4 - 2}{1 - (-1)} = -3$

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

$f'(c) = 3c^2 - 6c - 4$

$-3 = = 3c^2 - 6c - 4$

$\emptyset = 3c^2 - 6c - 1$

a) $c_1 = 2.1547$

a) $= 2.1547$

No satisface en $(-1, 1)$

a, b)

$f'(x) = 3x^2 - 6x - 4 \rightarrow \; ; \; [-1, 1] = 0.1547$

b) $= 0.1547$

c) $f'(c) = -3$

$f'(c) = \dfrac{-4 - 2}{1 - (-1)} = -3$

c) $= -3$

a) $N = \sqrt{686x - x^4} - 7\sqrt[3]{49x}$

$$\lim_{x \to 7} \left(\sqrt{686x - x^4} - 7\sqrt[3]{49x} \right)$$

$$98 - \frac{14(x-7)}{3} - \frac{65}{18}(x-7)^2 - \frac{887(x-7)^3}{1134} - \frac{23651(x-7)^4}{95256} - \frac{182803(x-7)^5}{2000\,376} + O((x-7)^6)$$

$$\lim_{x \to 7} = 98$$

$$\boxed{\lim_{x \to 7} \left(\sqrt{686x - x^4} - 7\sqrt[3]{49x} \right) = 98}$$

$D = 7 - \sqrt[4]{7x^3}$

$$\lim_{x \to 7} \left(7 - \sqrt[4]{7x^3} \right)$$

$$-\frac{3(x-7)}{4} + \frac{3}{224}(x-7)^2 - \frac{5(x-7)^3}{6272} + \frac{45(x-7)^4}{702464} - \frac{117(x-7)^5}{14668492} + \frac{663(x-7)^6}{1107463552} + O((x-7)^7)$$

$$\lim_{x \to 7} \left(7 - \sqrt[4]{7x^3} \right) = 0$$

$$\boxed{\lim_{x \to 7} \left(7 - \sqrt[4]{7x^3} \right) = 0}$$

$$\frac{N}{D} = \frac{\sqrt{686x - x^4} - 7\sqrt[3]{49x}}{7 - \sqrt[4]{7x^3}}$$

$$\lim_{x \to 7} = \left(\frac{\sqrt{686x - x^4} - 7\sqrt[3]{49x}}{7 - \sqrt[4]{7x^3}} \right)$$

$$\to \frac{112}{9} + \frac{128(x-7)}{27} + \frac{3847(x-7)^2}{3402} + \frac{394397(x-7)^3}{1743072} + \frac{24465005(x-7)^4}{192636096}$$

$$+ \frac{4970200939(x-7)^5}{96786190884} + O((x-7)^6)$$

$$\lim_{x \to 7} \left(\frac{\sqrt{686x - x^4} - 7\sqrt[3]{49x}}{7 - \sqrt[4]{7x^3}} \right) = \frac{112}{9} = 12.4444$$

$x = \sqrt[12]{132} = 1.502154$

$x^{12} = 132$

$x^{12} - 132 = 0$

$f(x) = x^{12} - 132 =$

$f(1) = -131$

$f(2) = (2)^{12} - 132 = 3964.0000$

$f(3) = (3)^{12} - 132 = 531309.0000$

$f(4) = (4)^{12} - 132 = 16777084.0000$

$f(5) = (5)^{12} - 132 = 244140493.0$

$f(6) = (6)^{12} - 132 = 2176782204.0$

$x_1 = 2$

$P_{(x)} = 12x^{11}$

$x_2 = x_1 - \dfrac{x_1^{12} - 132}{12 x^{11}} = 1.838704$

$x_3 = x_2 - \dfrac{x_2^{12} - 132}{12 x_2^{11}} = 1.699023$

$x_4 = x_3 - \dfrac{x_3^{12} - 132}{12 x_3^{11}} = 1.589737$

$x_5 = x_4 - \dfrac{x_4^{12} - 132}{12 x_4^{11}} = 1.52473$

$x_6 = x_5 - \dfrac{x_5^{12} - 132}{12 x_5^{11}} = 1.503851$

$x_6 = 1.503851$

$x_7 = x_6 - \dfrac{x_6^{12} - 132}{12 x_6^{11}} = \quad x_7 = 1.502164$

$\boxed{x_7 = 1.502164}$

$$3x^2 + 1x + 3$$

$$x = 2 \quad ; \quad x = 7$$

$$\int_2^7 (3x^2 + 1x + 3)\, dx$$

a) $h = 10$

$$\Delta x = \frac{b-a}{h}$$

$$\Delta x = \frac{7-2}{10} = \boxed{0.5}$$

x_1	2 + 0.5		2.5
x_2	2.5 + 0.5		3.0
x_3	3.0 + 0.5		3.5
x_4	3.5 + 0.5		4.0
x_5	4.0 + 0.5		4.5
x_6	4.5 + 0.5		5.0
x_7	5.0 + 0.5		5.5
x_8	5.5 + 0.5		6.0
x_9	6.0 + 0.5		6.5
x_{10}	6.5 + 0.5		7.0

$$f(x) = 3x^2 + 1x + 3$$

$$F(2.5) = 3(2.5)^2 + 1(2.5) + 3 = 24.2500$$

$$F(3.0) = 3(3.0)^2 + 1(3.0) + 3 = 33.0000$$

$$F(3.5) = 3(3.5)^2 + 1(3.5) + 3 = 43.2500$$

$$F(4.0) = 3(4.0)^2 + 1(4.0) + 3 = 55.0000$$

$$F(4.5) = 3(4.5)^2 + 1(4.5) + 3 = 68.2500$$

$$F(5.0) = 3(5.0)^2 + 1(5.0) + 3 = 83.0000$$

$$F(5.5) = 3(5.5)^2 + 1(5.5) + 3 = 99.2500$$

$$F(6.0) = 3(6.0)^2 + 1(6.0) + 3 = 117.0000$$

$$F(6.5) = 3(6.5)^2 + 1(6.5) + 3 = 136.2500$$

$$F(7.0) = 3(7.0)^2 + 1(7.0) + 3 = \underline{157.0000}$$

$$816.2500$$

$$A = \sum_{i=1}^{10} F(x_i)\, \Delta x$$

$$A = (816.2500)(0.5)$$

$$A = 408.1250$$

$$\boxed{A = 408.1250}$$

b) $408.1250 - 372.5$

$= 35.625$

$$\frac{35.625}{408.1250} * 100 = 8.7289\%$$

$\boxed{8.7289\%}$