Laboratorio # 2 David Gabriel Corzo Mcmath

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(1)

a) $f(x) = \int_{1}^{x} \frac{1}{t^3+1}\,dt = \frac{1}{x^3+1}\cdot 1$ 5

110 pts *

b) $h(r) = \int_{-100}^{r} \sqrt{x^2+4}\,dx = \sqrt{r^2+4}\cdot 1$ 5

c) $i(x) = \int_{0}^{x^4} \cos^2(\theta)\,d\theta = \cos^2(x^4)\cdot 4x^3$ 5

d) $j(x) = \int_{\sec x}^{\tan x} \sqrt{t+\sqrt{t}}\,dt =$

$\sqrt{(\tan x)+\sqrt{(\tan x)}}\cdot \sec^2 x - \sqrt{\sec x + \sqrt{\sec x}}\cdot \sec x \tan x$ 10

e) $K(x) = \int_{x^3-x}^{x^4+x} \frac{u^3}{1+u^2}\,dt =$

$\left\{\frac{(x^4+x)^3}{1+(x^4+x)^2}\cdot(4x^3+1)\right\} - \left\{\frac{(x^3-x)^3}{1+(x^3-x)^2}\cdot(3x^2-1)\right\}$ 10

② $f(x) = \int_0^x \sin\left(\frac{\pi}{2} t^2\right) dx$; recta tangente en $x = 1$

ecuación

$f'(x) = \sin\left(\frac{\pi}{2} x^2\right) \cdot 1$

$y = f(1) + f'(1)(x-1)$

$y = 0.4382591 + 1(x-1)$

$y = x - 1 + 0.4382591$

$y = x - 0.5617409$

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③ $C'(x) = 3000 + 2x + \frac{3}{10} x^2$

$\int_{10}^{20} C'(x) = \int_{10}^{20} 3000 + 2x + \frac{3}{10} x^2 \, dx$

$\int_{10}^{20} C'(x) = \int_{10}^{20} 3000 dx + \int_{10}^{20} 2x \, dx + \int_{10}^{20} \frac{3}{10} x^2 \, dx$

$C(x) = 3000x + \frac{2x^2}{2} + \frac{3}{10} \cdot \frac{x^3}{3}$

$C(x) = 3000x + x^2 + \frac{x^3}{10} + C \Big|_{10}^{20}$

$\left\{3000(20) + (20)^2 + \frac{(20)^3}{10}\right\} - \left\{3000(10) + (10)^2 + \frac{(10)^3}{10}\right\}$

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$61200 - 30200 = 31000$ de aumento cuando se incrementa de 10 a 20 yardas

④ $P'(t) = 40\sqrt[3]{t}$

$$\int_0^8 P'(t) = \int_0^8 40\sqrt[3]{t}\,dt$$

$$= 40\int_0^8 \frac{(t)^{1/3+1}}{1/3+1}\,dt$$

$$= 40\ \frac{t^{4/3}}{4/3}$$

$$= \frac{40 \cdot 3\,(t^{4/3})}{4}$$

$$= \frac{\cancel{4} \cdot 10 \cdot 3\,(t^{4/3})}{\cancel{4}}$$

$$= 30\,(t^{4/3})\Big]_0^8 = \{30\,(8^{4/3})\} - \{30\,(0^{4/3})\}$$

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$= 480$ macetas de cemento

⑤ $v(t) = 3t - 6\ ,\ 0 \le t \le 3$

a) $I_x ;\ y = 0$

$3t - 6 = 0$

$3t = 6$

$t = \frac{6}{3} = 2$

$I_y ;\ x = 0$

$3(0) - 6 = y$

$-6 = y$

$$\int_0^3 3t - 6\ dt = 3\int t\,dt - \int 6\,dt =$$

$$= \frac{3t^2}{2} - 6t\Big]_0^3 = \left\{\frac{3}{2}(3)^2 - 6(3)\right\} - \left\{\frac{3(0)}{2} - 6(0)\right\}$$

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$= -\frac{9}{2}$ m

b) $\int 3t-6\ dt$

$$d = \frac{3t^2}{2} - 6t$$

$$d = -\frac{3t^2}{2} + 6t \Big]_0^2 + \frac{3t^2}{2} - 6t \Big]_2^3$$

$$\left\{\left[-\frac{3(2)^2}{2} + 6(2)\right] - \left[0\right]\right\} + \left\{\left[\frac{3(3)^2}{2} - 6(3)\right] - \left[\frac{3(2)^2}{2} - 6(2)\right]\right\}$$

$$\left\{-\frac{12}{2} + 12\right\} + \left\{\frac{27}{2} - 18 - \frac{12}{2} + 12\right\}$$

$$6 + \frac{3}{2} = \underline{\frac{15}{2}\ m}$$

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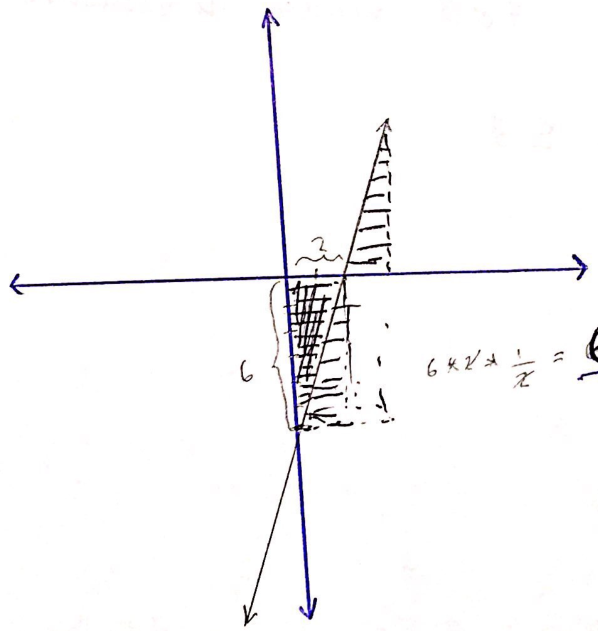
c)



$$A = \frac{6(2)}{2} + \frac{3(1)}{2} = \frac{15}{2}$$

5

$$6 \times 2 \times \frac{1}{2} = \underline{6\ m^2}$$

⑥ a) $f(x) = \int_{-\pi/3}^{\pi/3} \left(\frac{3}{5}(x^3 + x)^5 - 2x^4 \sin x \right) dx$

$= 0$ porque es impar.

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b) $g(x) = \frac{1}{\pi} \int_{-\sqrt{3}}^{\sqrt{3}} \frac{1}{1+x^2}\, dx$

$\frac{1}{\pi}\left(\tan^{-1}(x) \right)\Big]_0^{\sqrt{3}} = \left\{ \left(\frac{1}{\pi} \tan^{-1}(\sqrt{3}) \right\} - \left\{ 0 \right\} \right\} * 2$

$\frac{1}{\cancel{\pi}} \cdot \frac{\cancel{\pi}}{3} = \frac{1}{3} * \frac{2}{1} = \frac{2}{3}$

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