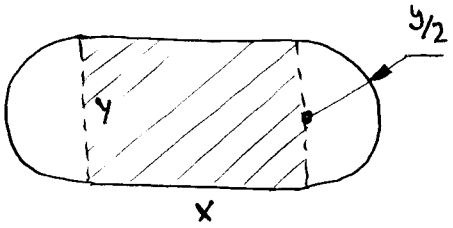
PREGUNTA 4:



$$A(x,y) = x \cdot y$$

$$P = 2x + 2 \cdot \pi \cdot \frac{y}{2} = 2x + \pi y = 200 \Rightarrow \Rightarrow y = \frac{200 - 2x}{\pi} \quad \Big\} *$$

$$* \quad A(x) = x\left(\frac{200-2x}{\pi}\right) = \frac{200x - 2x^2}{\pi}$$

$$A'(x) = \frac{1}{\pi}(200 - 4x) \; ; \quad A'(x) = 0 \Rightarrow 200 - 4x = 0 \Leftrightarrow \boxed{x = 50m} \Rightarrow \boxed{y = \frac{100}{\pi} m}$$

En ese caso resulta $A = 50 \cdot \frac{100}{\pi} = \frac{5000}{\pi} m^2 \quad (\simeq 1591{,}5 m^2)$

Tomemos otros valores al azar: $x = 40m \Rightarrow y = \frac{120}{\pi} m$

$A = 40 \cdot \frac{120}{\pi} = \frac{4800}{\pi} < \frac{5000}{\pi} m^2$ Por lo tanto nuestros valores son un MÁXIMO

PREGUNTA 5:

a) $f(x) = \sqrt{x} + \sqrt[3]{x} \Rightarrow f'(x) = \frac{1}{2\sqrt{x}} + \frac{1}{3\sqrt[3]{x^2}}$

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

c) $f(x) = \operatorname{tg}\left(x^3 + 2x^2 - \frac{\pi}{3}\right) \Rightarrow f'(x) = \frac{1}{\cos^2\left(x^3 + 2x^2 - \frac{\pi}{3}\right)} \cdot (3x^2 + 4x)$

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

$(\ln x^2 = 2\ln x)$

e) $\varphi(x) = x \cdot e^{2x+1} \Rightarrow f'(x) = e^{2x+1} + x \cdot e^{2x+1} \cdot 2 = e^{2x+1}(1 + 2x)$