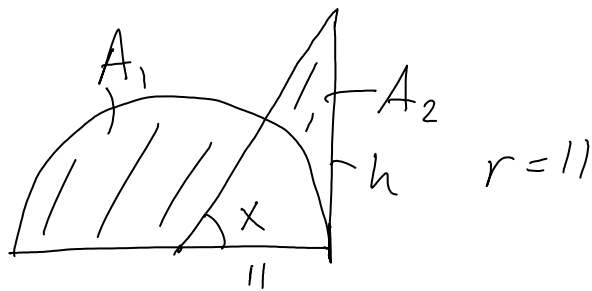


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den 5 februari 2010
13:24

Lsg)



Minimera skuggad area A .

Vi uttrycker A i x :

$$A_1 = \frac{\pi - x}{2\pi} \cdot \pi \cdot 11^2 = \frac{121}{2} (\pi - x)$$

$$A_2 = \frac{11 \cdot h}{2} - \frac{x}{2\pi} \cdot \pi \cdot 11^2 = \frac{11^2 \cdot \tan x}{2} - \frac{11^2 x}{2} =$$

$$\left(\tan x = \frac{h}{11} \right)$$

$$= \frac{121}{2} (\tan x - x)$$

$$A(x) = A_1 + A_2 = \frac{121}{2} (\pi - x + \tan x - x) =$$

$$= \frac{121}{2} (\pi + \tan x - 2x), \quad 0 \leq x \leq \pi$$

$$A'(x) = \frac{121}{2} (1 + \tan^2 x - 2) = \frac{121}{2} (\tan^2 x - 1)$$

$$(D(\tan x) = \tan^2 x)$$

$$A'(x) = 0 \Rightarrow \tan^2 x = 1 \Leftrightarrow \tan x = \pm 1 \Leftrightarrow$$

$$\Leftrightarrow x = \frac{\pi}{4} \quad / \quad \text{i intervallet } 0 \leq x \leq \pi$$

$$\Leftrightarrow x = \frac{\pi}{4} \quad (\text{i intervallet } 0 \leq x \leq \pi).$$

Teckenstudie:

x	0	$\frac{\pi}{4}$	π
A'	-	0	+
A		↘ -	↗

Minimal area då $x = \frac{\pi}{4}$. Area blir

$$\begin{aligned} A\left(\frac{\pi}{4}\right) &= \frac{121}{2} \left(\pi + \tan \frac{\pi}{4} - 2 \cdot \frac{\pi}{4} \right) = \\ &= \frac{121}{2} \left(\frac{\pi}{2} + 1 \right) \end{aligned}$$