D3224

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14:13

a) Konens volym : $V = \frac{\pi x^2 y}{3}$ $\left(\frac{\pi r^2 h}{3} \right)$

b) $y = 4 - x^2$

c) $V(x) = \frac{\pi x^2 (4 - x^2)}{3}$

d) $0 < x < 2$ facit : $-2 < x < 2$ ett (sämre) alt.

e) $V(x) = \frac{\pi x^2 (4 - x^2)}{3} = \frac{\pi}{3}(4x^2 - x^4)$

$\Rightarrow$

$V'(x) = \frac{\pi}{3}(8x - 4x^3)$

$V'(x) = 0$ ger $8x - 4x^3 = 0$

$\Leftrightarrow$

$4x(2 - x^2) = 0$

$\Leftrightarrow$

$x = 0$ el $x = \pm\sqrt{2}$

förkastas

Verifiera max/min med $V''(x)$

$$V''(x) = \frac{\pi}{3}(8 - 12x^2)$$

$$V''(\sqrt{2}) = \frac{\pi}{3}(8 - 12 \cdot \sqrt{2}^2) < 0$$

Alltså lok max då $x = \sqrt{2}$

Volymen blir $V(\sqrt{2}) = \frac{\pi}{3}(4 \cdot \sqrt{2}^2 - \sqrt{2}^4)$

$$= \frac{\pi}{3}(8 - 4) = \frac{4\pi}{3}$$