15.27

onsdag 4 januari 2023 20:12

27) $y(4) = 0 \quad y(0) = 7 \text{ (dm)}$ $y(t)$ = vatten djupet i badkaret (efter + minuter)

$$y' = -k\sqrt{y} \iff \int \frac{1}{\sqrt{y}}\,dy = -\int k\,dt \iff$$

$$\iff 2\sqrt{y} = -kt + C \iff y = \left(-\frac{kt}{2} + B\right)^2$$

$B = \frac{1}{2}C$

$$y(0) = \left(-\frac{0}{2} + B\right)^2 = 7 \qquad B = (\pm)\sqrt{7}$$

$$y(4) = \left(-\frac{4k}{2} + \sqrt{7}\right)^2 = \left(-2k + \sqrt{7}\right)^2 = 0$$

$$k = \sqrt{7}/2$$

Sv: $y = \left(-\frac{\sqrt{7}\,t}{4} + \sqrt{7}\right)^2$, $k = \sqrt{7}/2$