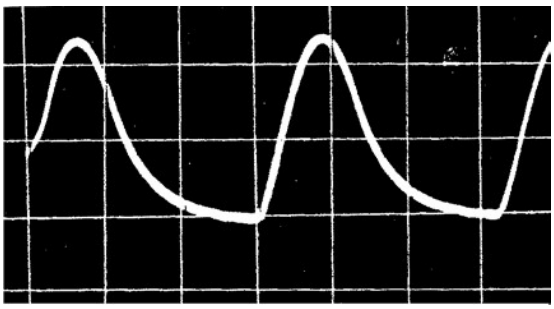
Solution:



The picture to the right shows the oscilloscope voltage over the resistor. The period of the sine wave is 5 ms and this gives the relation 1 horizontal division = 1.5 ms. The actual vertical scale was 0.85 V / division. The first rising part of the curve is a section of a sine wave, the second falling part is an exponential decay determined by the time constant of the resistor and capacitor. Reading from the display the "half-life" $t_{1/2} = RC \cdot \ln 2$ turns out to be 0.5 ms. This gives R = 7.2 kΩ. The mean power developed in the resistor is

$\langle P \rangle = \frac{1}{T} \int_0^T \frac{U^2(t)}{R} dt$. Numerical integration (counting squares) gives

$\int_0^T U^2(t) dt = 4{,}5 \cdot 10^{-3}\ \mathrm{V^2 s}$ from which $\langle P \rangle \approx 0.1$ mW.