2.1

2 a) $f_{CLK} = 16 \cdot f_{sample}$ $\quad f_{sample} = \frac{1\,MHz}{16} = 62{,}5\ ksps$

Max F_{clk} of RPi SPI = 1 MHz

↑ Fra adc_sampler.c fil

b) $res = \frac{3{,}3V}{2^{12}-1} = 0{,}806\,mV$ per steg

c) $V_{dd} + 0{,}6\,V$ $\quad V_{ss} - 0{,}6\,V$

$3{,}9\,V$ $\quad -0{,}6\,V$

2.2

$$H(\omega) = \frac{\frac{1}{j\omega C}}{j\omega L + \frac{1}{j\omega C}} = \frac{1}{1-\omega^2 LC}$$

$$|H(\omega_c)| = \left|\frac{1}{1-\omega_c^2 LC}\right| = \frac{1}{\sqrt{2}}$$

$\sqrt{2} = 1 - \omega_c^2 LC$, $\omega_c^2 LC < 1$

$\omega_c^2 = \frac{1-\sqrt{2}}{LC}$, $\sqrt{2} = -1{,}4142$

$f_c = \frac{\sqrt{1-\sqrt{2}}}{2\pi\sqrt{LC}} = 36\,Hz$

$$20 \log \left(\frac{\sqrt{6}}{2} 2^N \cdot \frac{2}{3,3} \right)$$