Prelab 3
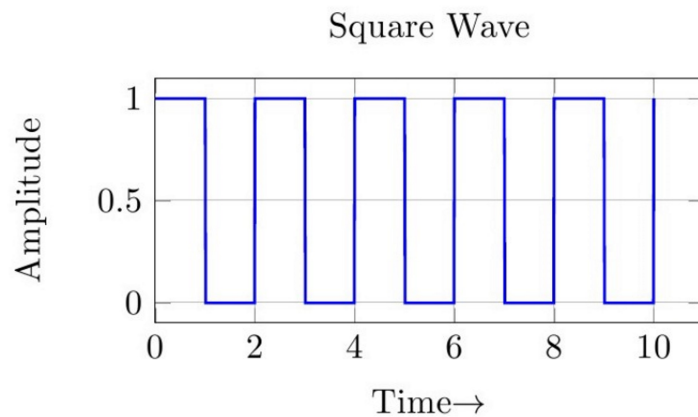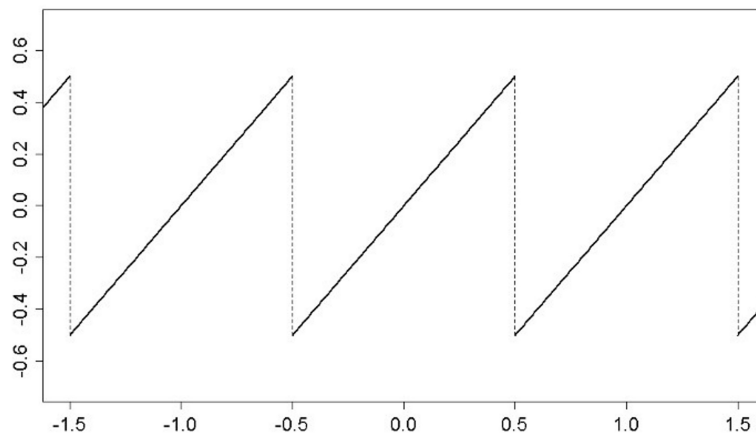
1) a) square wave

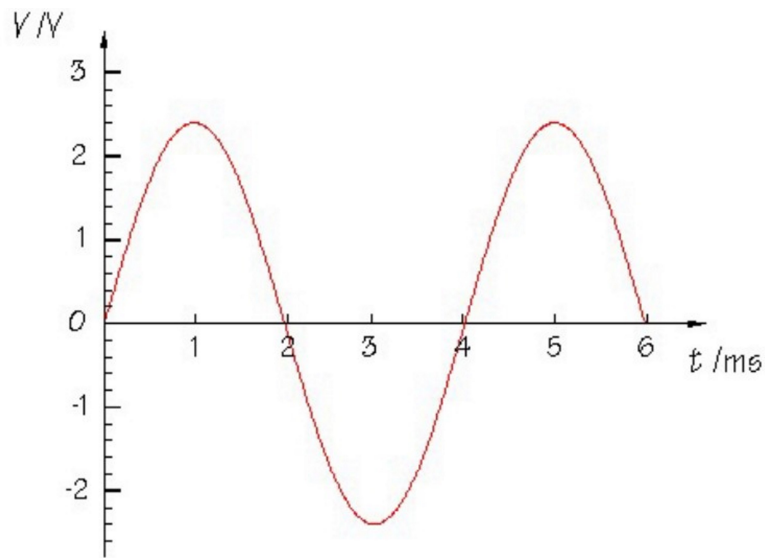$$V_{rms} = V_{pp}/2 = V_{pk} = 0.5V$$

b) Sawtooth wave

$$V_{RMS} = \frac{V_{pp}}{2\sqrt{3}} = \frac{V_p}{\sqrt{3}} = \frac{0.5}{\sqrt{3}} = \frac{1}{2\sqrt{3}}$$
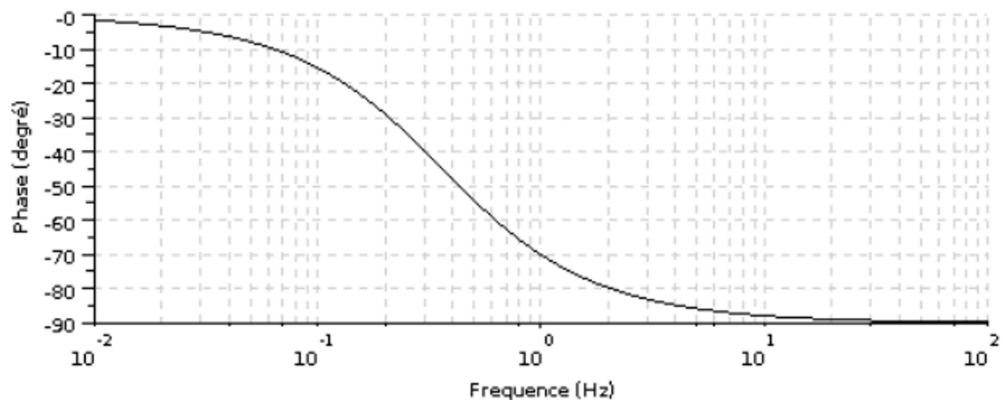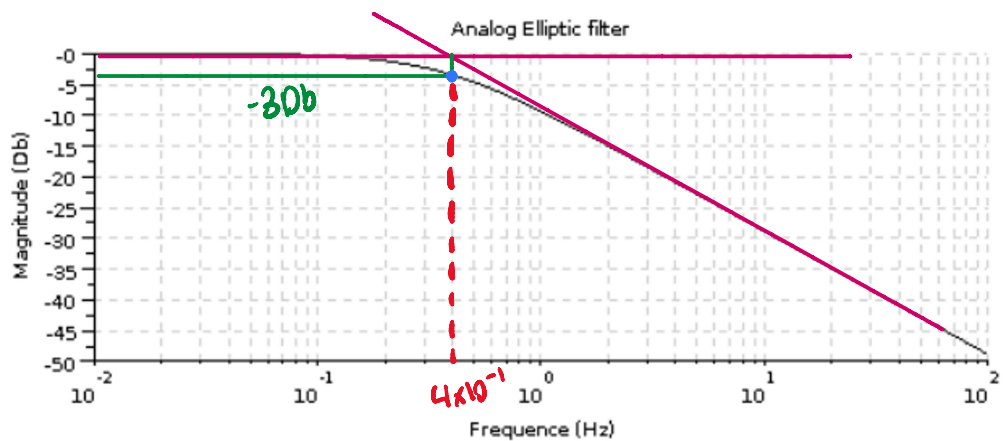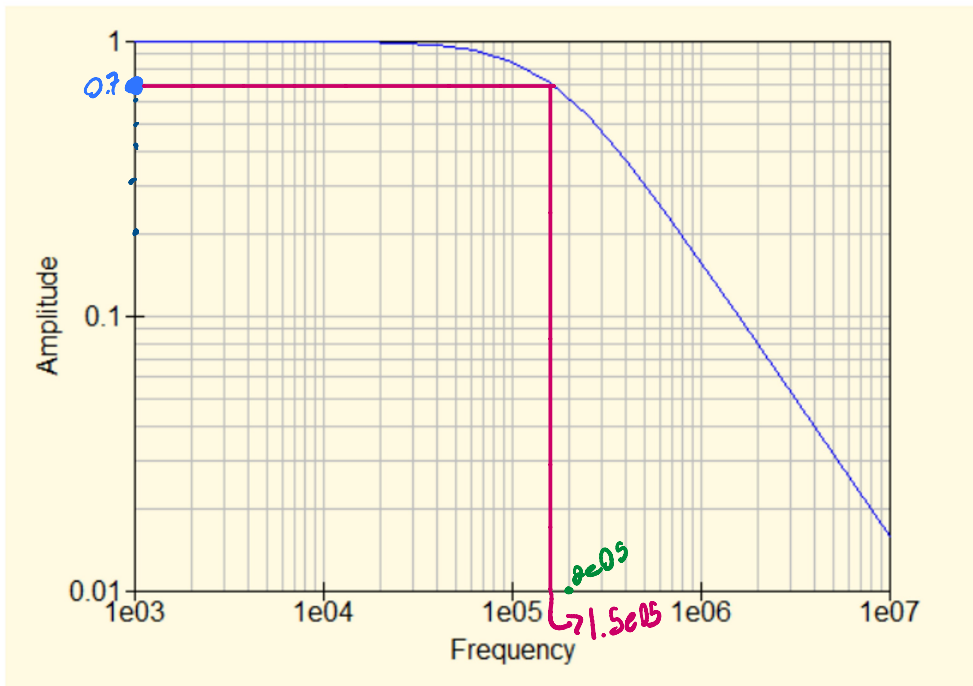
c)

V/V

3

$$V_{RMS} = \frac{2.5}{\sqrt{2}} = \frac{5}{2\sqrt{2}}$$

2) a) $f_c = 0.4\ Hz$

Analog Elliptic filter

-3Db

4×10⁻¹

b)

Magnitude ⟷ Amplitude

$$\text{Power (Db)} = 20\log_{10}\left(\frac{A}{A_{ref}}\right)$$

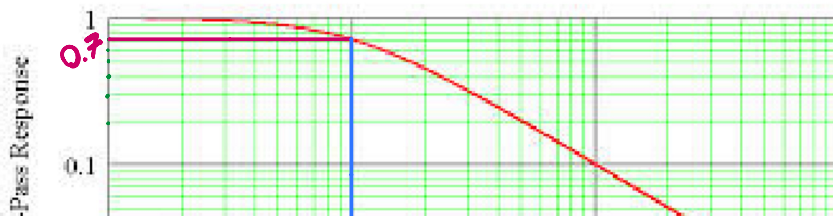$$-3 = 20\log_{10}\left(\frac{A}{1}\right)$$
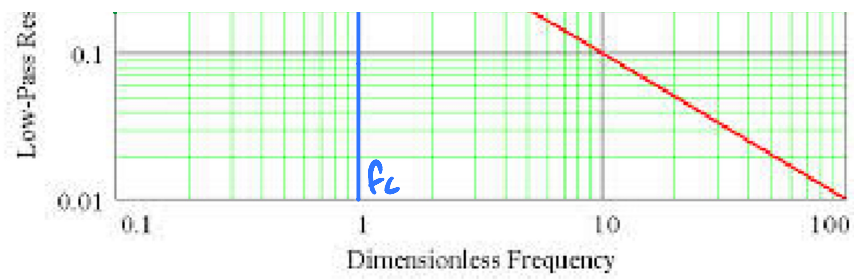
$$10^{-3/20} = A$$

$$A \doteq 0.701$$

$$A \approx 0.7$$

from graph $f_c \approx 1.5 \times 10^5 \, Hz$

c)

(c) Bode plot 3

f_c occurs @ response = 70.7%
≈ 0.7

$f_c = 1$