opg 3.1

a)

z-transform $y(n) = \cos(\omega_0 nT)$

$$Y(z) = \sum_{n=0}^{\infty} y(n) z^{-n}$$

vi bruger tabel zT7

$$Y(z) = \frac{z^2 - \cos(\omega_0 T)z}{z^2 - 2(\cos(\omega_0 T)z + 1}$$

b)

vi finder nulpunkter for y(z)

benyt $\omega_0 T = 1$

vi finder først nulpunkter.

$z^2 - \cos(1) \cdot z = 0$

$d = \cos(1)^2 - 4 \cdot 1 \cdot 0 = \cos(1)^2$

$$z = \frac{-\cos(1) \pm \sqrt{\cos(1)^2}}{2 \cdot 1} = 0 \vee \cos(1)$$

derefter poler

$z^2 - 2(\cos(1))z + 1 = 0$

$d = (-2\cos(1)z)^2 - 4 \cdot 1 \cdot 1 = 4\cos(1)^2 z^2 - 4$

$$z = \frac{--2\cos(1) \pm \sqrt{4\cos(1)^2 - 4}}{2 \cdot 1} = \frac{2\cos(1) \pm 2\cos(1) + 2j}{2}$$

$= 0{,}54 + 0{,}84j \vee -0{,}54 + 0{,}84j$

vi plotter så poler og nulpunkter