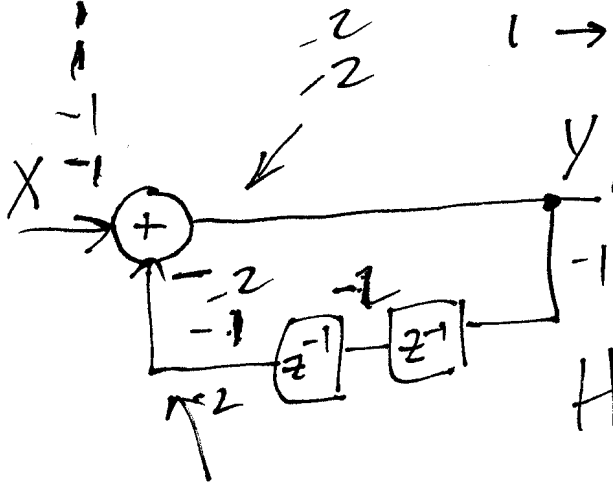
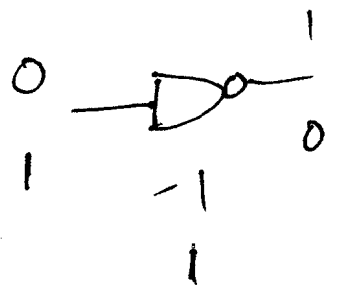


Problem 1.11

0 → -1 11 (≠ 1)  
 1 → +1 01 (+1)  
 00(0)



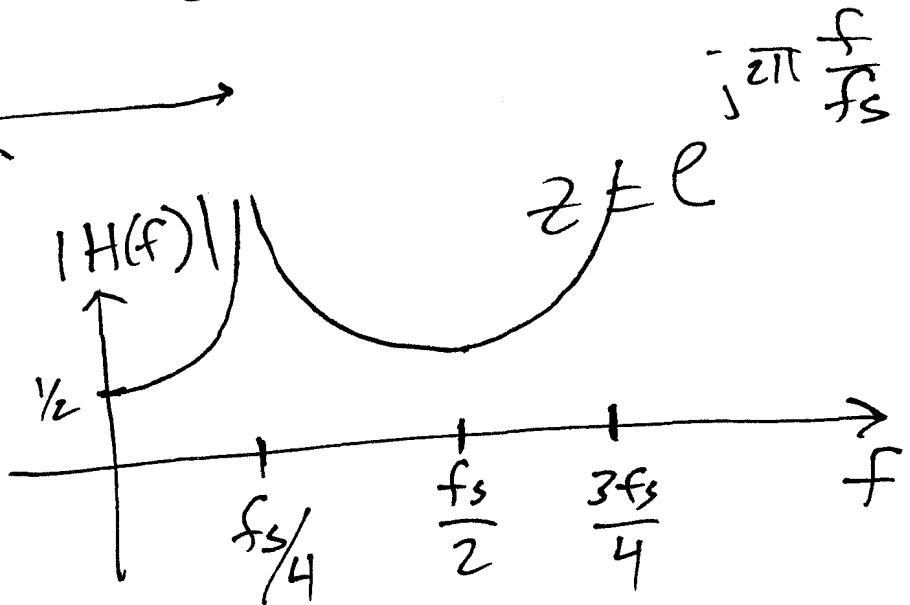
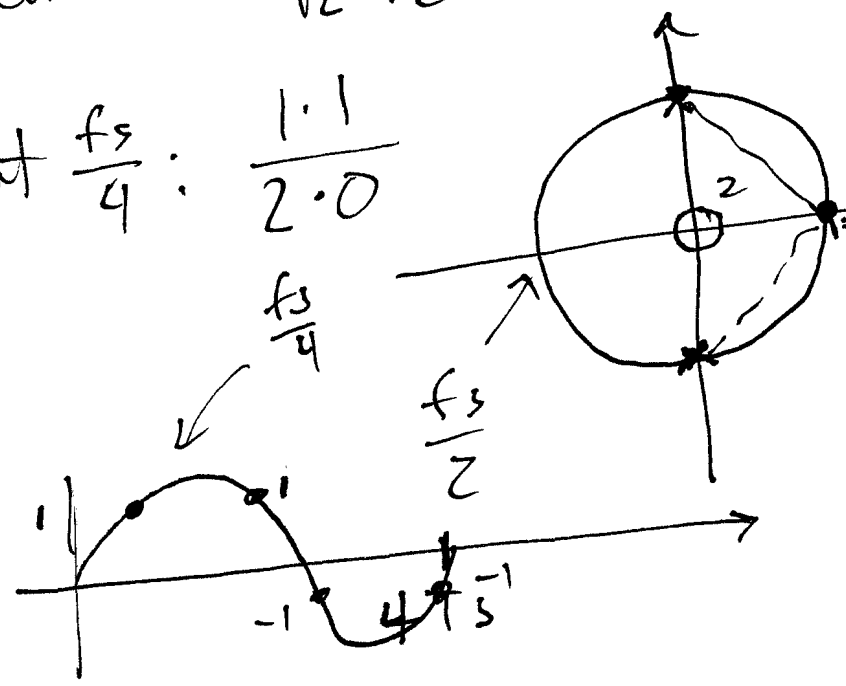
$$Y = X - Yz^{-2}$$

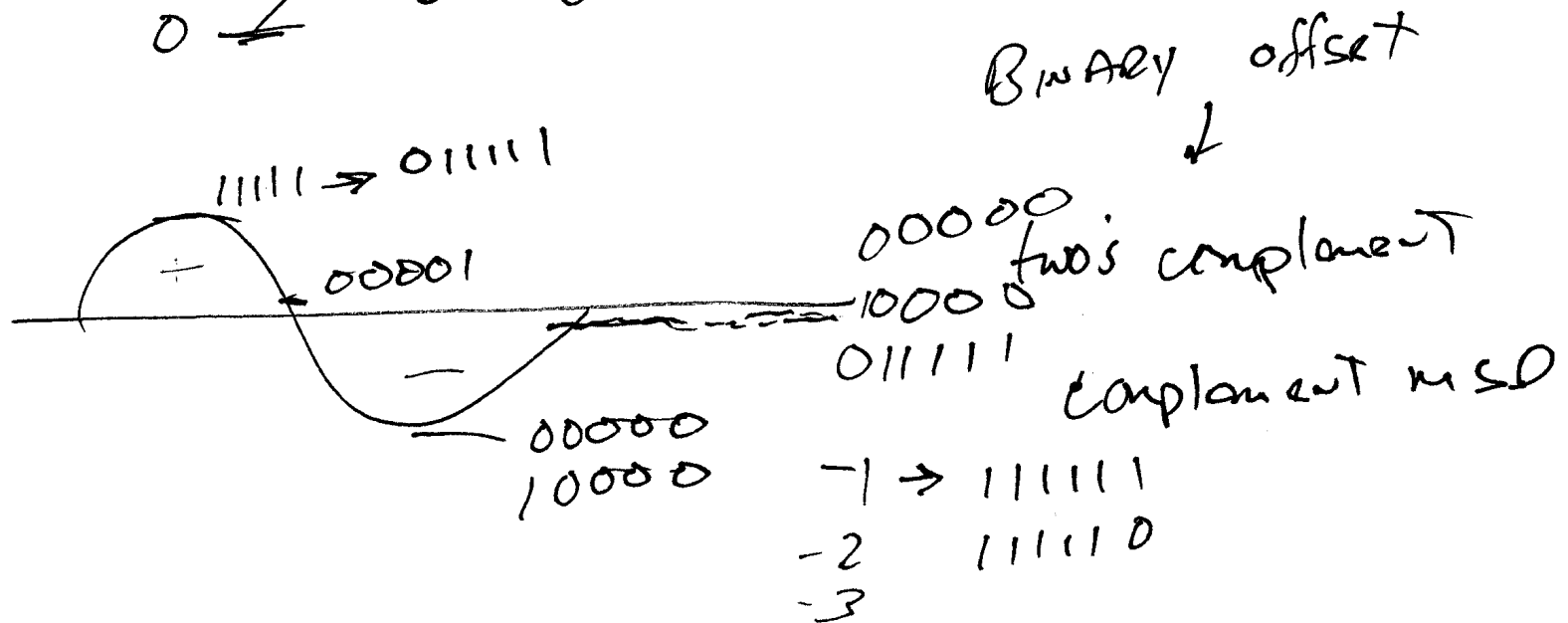
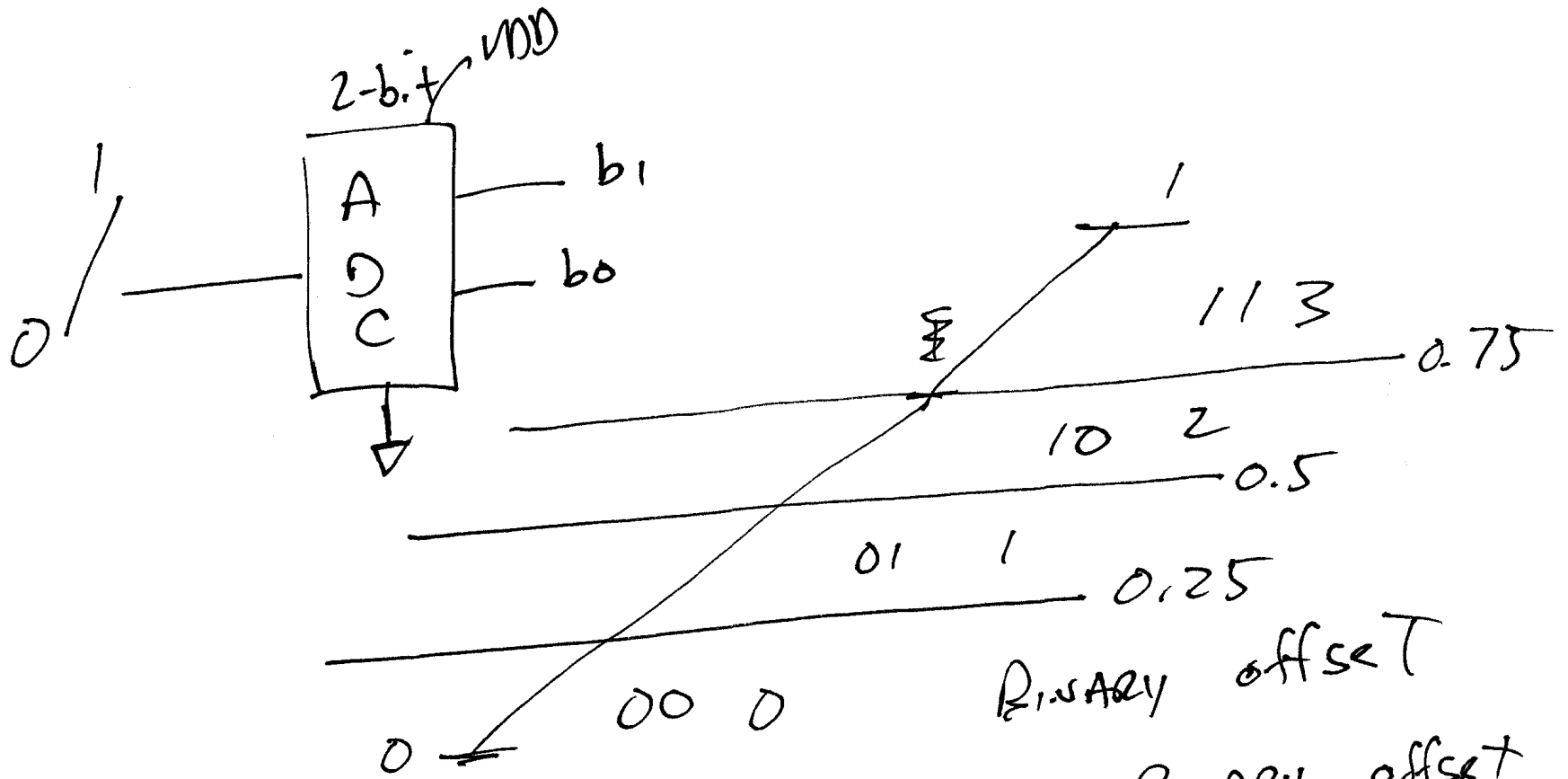
$$H(z) = \frac{Y(z)}{X(z)} = \frac{1}{1 + z^{-2}}$$

$$\frac{(z+0)(z^{\frac{2}{2}}+0)}{(z+j)(z-j)} = \frac{z^2}{z^2+1}$$

at DC:  $\frac{1 \cdot 1}{\sqrt{2} \cdot \sqrt{2}}$

at  $\frac{f_s}{4}$ :  $\frac{1 \cdot 1}{2 \cdot 0}$





3-bit

111 ~~7~~  
001 1

7-5  
/

~~0~~011 +3  
101 -3

111 →  
101

011 (+3)  
001 (+1)

0011  
1101  

---

0000

7  
+6

subtract

111 7  
110 6

11  
011  
110  
001  

---

1010 (+2)

1+z<sup>-1</sup>  
-z<sup>-2</sup>  
1-z

1000 +8

0011 +3  
0010 +2  

---

0101 +5

1101 +13

111  
001  

---

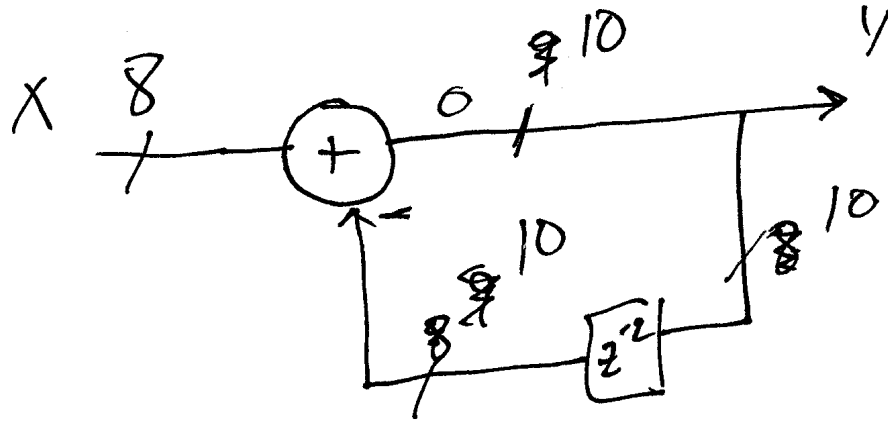
1000 +8

0011 +3  
1101 -3  

---

~~0~~000 (0)

3)



two's comp

$$\begin{matrix} 1 \\ 0 \\ 0 \end{matrix} \rightarrow \begin{matrix} 0 \\ 0 \\ 0 \end{matrix}$$

$$\begin{matrix} 1 \\ 0 \\ 1 \end{matrix} \rightarrow \begin{matrix} 0 \\ 0 \\ 1 \end{matrix} + 1$$

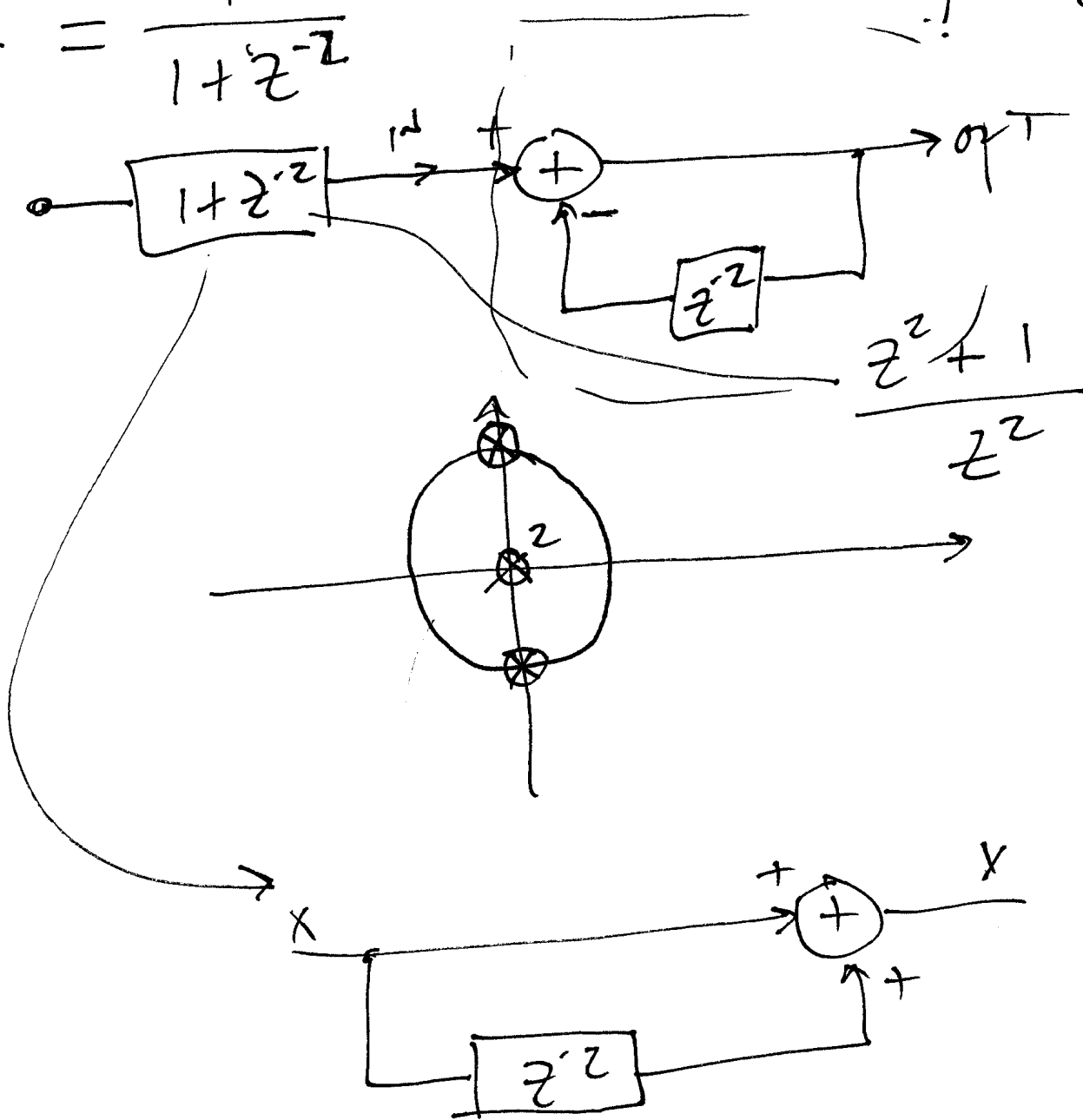
$$+1 \rightarrow 01$$

$$\begin{matrix} 001 \\ / \\ 11 \\ \hline 2 \end{matrix}$$

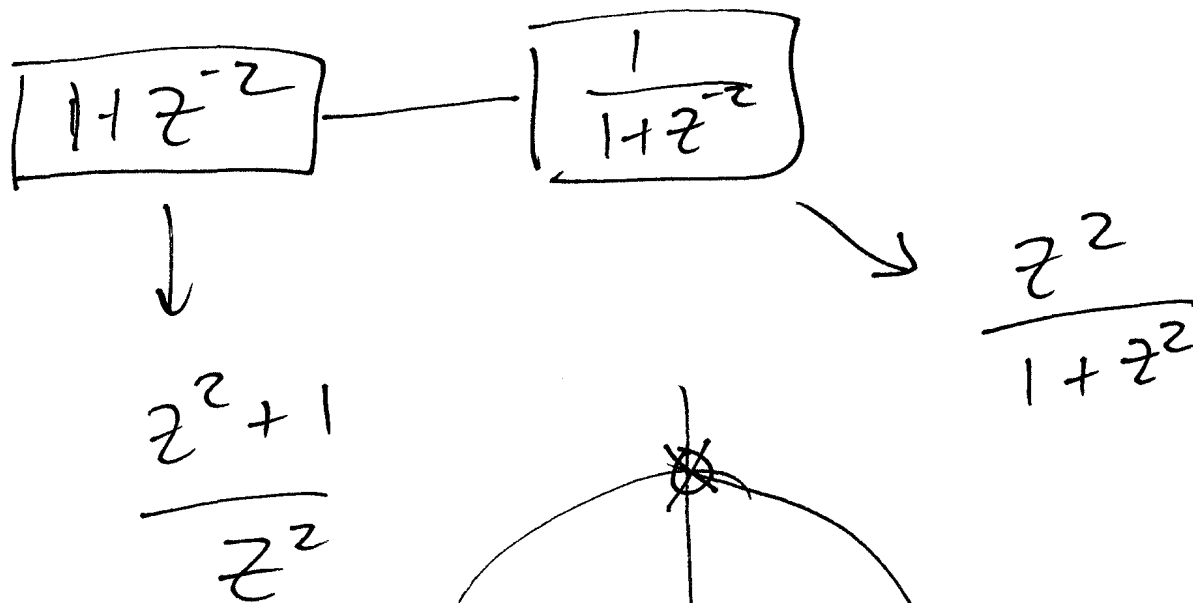
$$\begin{matrix} 0001 \\ \nearrow \\ 11 \\ \hline 2 \\ \hline 4 \end{matrix}$$

4)

$$\frac{Y}{X} = \frac{1}{1+z^{-2}}$$

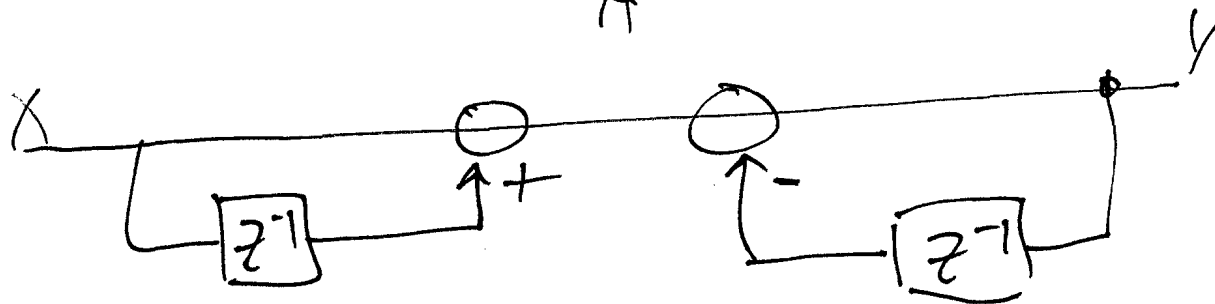
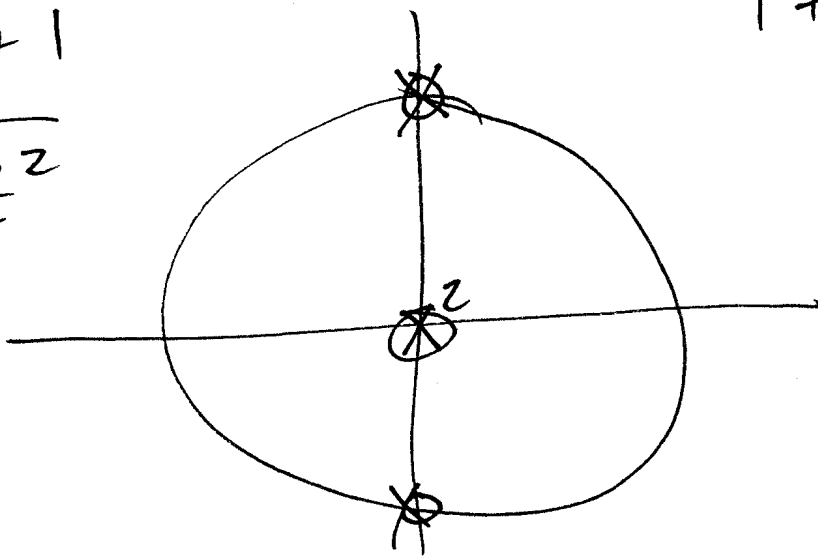


5)



$$\frac{z^2+1}{z^2}$$

$$\frac{z^2}{1+z^2}$$



6)