1° the numbers of input and output nodes of Network 1 and 2 are 6 which are the same

2° For Network 1:

output $\vec{a}^{(3)} = W^{(3)}\vec{a}^{(2)} + \vec{b}^{(3)}$

$= W^{(3)}(W^{(2)}\vec{a}^{(1)} + \vec{b}^{(2)}) + \vec{b}^{(3)}$

$= W^{(2)}W^{(3)}\vec{a}^{(1)} + W^{(3)}\vec{b}^{(2)} + \vec{b}^{(3)}$

$= W^{(1)}W^{(2)}W^{(3)}(W^{(1)}\vec{a}^{(0)} + \vec{b}^{(1)}) + W^{(3)}\vec{b}^{(2)} + \vec{b}^{(3)}$

$= W^{(1)}W^{(2)}W^{(3)}\vec{a}^{(0)} + W^{(2)}W^{(3)}\vec{b}^{(1)} + W^{(3)}\vec{b}^{(2)} + \vec{b}^{(3)}$

For Network 2:

output $\vec{a} = \tilde{W}\vec{a}^{(0)} + \vec{\tilde{b}}$

for any inputs $\vec{a}^{(0)} = \vec{\tilde{a}}^{(0)}$,

the outputs should be the same

that is $\vec{a}^{(3)} = \vec{\tilde{a}}$

then the coefficients equal

that is $\tilde{W} = W^{(1)}W^{(2)}W^{(3)}$

$\vec{\tilde{b}} = W^{(2)}W^{(3)}\vec{b}^{(1)} + W^{(3)}\vec{b}^{(2)} + \vec{b}^{(3)}$