

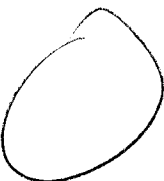
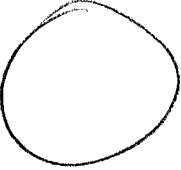


The data below are given in per unit. R and X are the series impedances of the transmission lines (in per unit ohms), and B is the line charging of the transmission lines (in per unit mhos).

Build the Y matrix. Show the complex terms individually. Do not perform any complex arithmetic such as inversions, and do not combine the terms.

From Bus	To Bus	R - pu ohms	jX - pu ohms	jB - pu mhos
1	2	0.004	j0.053	j0
2	3	0.02	j0.25	j0.22
3	4	0.02	j0.25	j0.22
2	4	0.01	j0.15	j0.11

	①	②	③	④
①	$\frac{1}{0.004 + j0.053}$	$\frac{-1}{0.004 + j0.053}$		
②	$\frac{-1}{0.004 + j0.053}$	$\frac{1}{0.004 + j0.053} + \frac{1}{0.02 + j0.25} + j\frac{0.22}{2}$ $+ \frac{1}{0.01 + j0.15} + j\frac{0.11}{2}$	$\frac{-1}{0.02 + j0.25}$	$\frac{-1}{0.01 + j0.15}$
③		$\frac{-1}{0.02 + j0.25}$	$\frac{1}{0.02 + j0.25} + j\frac{0.22}{2}$ $+ \frac{1}{0.02 + j0.25} + j\frac{0.22}{2}$	$\frac{-1}{0.02 + j0.25}$
④		$\frac{-1}{0.01 + j0.15}$	$\frac{-1}{0.02 + j0.25}$	$\frac{1}{0.02 + j0.25} + j\frac{0.22}{2}$ $+ \frac{1}{0.01 + j0.15} + j\frac{0.11}{2}$