
Module 12

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sympref('FloatingPointOutput',true); format short; format compact
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Problem 10.16

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clear all
syms va vb
% Nodal analysis directly in solve()
[va,vb]=solve(va/5 - 2 + (va-vb)/(j*4) == 0,...
vb/(-j*3) + (vb-vb)/(j*4) - 3*exp(j*45*2*pi/360)== 0, va,vb) % and
vx = va-vb
double([abs(vx),angle(vx)])

va =
5.2800 - 5.4200i
vb =
9.6159 - 9.1960i
vx =
- 4.3360 + 3.7760i
ans =
5.7497 2.4251

%%9.8
clear all
a=(60*exp(j*45*pi/180))/(7.5-j*10)+j*2
double([abs(a),angle(a)])

b=(32*exp(-20*pi/180))/((6-j*8)*(4+j*2))+20/(-10+j*24)
double([abs(b),angle(b)])

c=20+16*exp(-50*pi/180)*(5+j*12)
double([abs(c),angle(c)])

a =
-0.6788 + 6.7518i
ans =
6.7858 1.6710
b =
0.1556 - 0.4843i
ans =
0.5087 -1.2600
c =
53.4269 +80.2246i
ans =
96.3869 0.9833

%%9.19
clear all
a=3*exp(j*10*pi/180)-5*exp(j*-30*pi/180)
double([abs(a),angle(a)])
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b=40*exp(-j*pi/2)+30*exp(j*-45*pi/180)
double([abs(b),angle(b)])

c=20*exp(-j*pi/2)+10*exp(j*60*pi/180)-5*exp(-j*pi/2*-20*pi/180)
double([abs(c),angle(c)])

a =
    -1.3757 + 3.0209i
ans =
    3.3194    1.9981
b =
    21.2132 -61.2132i
ans =
    64.7847    -1.2372
c =
    0.7330 -13.9460i
ans =
    13.9652    -1.5183

%%9.35
i=50*exp(j)/(10-j+4*j)
double([abs(i),angle(i)])

i =
    3.6364 + 3.1164i
ans =
    4.7891    0.7085

%%9.43
i=60/(50+1/((1/j*80)+1/(100-j*40)))
double([abs(i),angle(i)])

i =
    1.2000 - 0.0003i
ans =
    1.2000    -0.0003

%%9.47
i=5*exp(j)/(2+1/(1/(-j*10)+1/(4*j+20)))
double([abs(i),angle(i)])

i =
    -0.1570 + 0.4332i
ans =
    0.4608    1.9185

%%9.50
clear all
syms Iin va vx
[va,vx, Iin]=solve(-Iin+va/(-10*j)+va/(10j+20), va/(10j+20)*20-vx,
    Iin==5*exp(j*40*pi/180), va, vx, Iin);

H = (vx/Iin);

double([abs(H),angle(H)])

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ans =
    10.0000    -1.5708

%%10.6
clear all
syms Iin va vx
[va, vx, Iin]=solve((va-4*vx)/20-3+(va)/(j*10+20), va/(j*10*20)*20-vx,
    Iin==3,va ,vx, Iin);

H=(vx/Iin);

double([abs(H),angle(H)])

ans =
    1.1111    -1.5708

%%10.11
clear all
syms Vin vb vc io
[vb, vc, io, Vin]=solve((vb-Vin)/2+vb/(-j)+(vb-vc)/(2*j), -1+(vc-vb)/
(2*j)+(vc-Vin)/(4*j-2*j)), vb/(-j)-io, Vin==8*exp(-j*(-pi/2*30*pi/180)), vb,
    vc, io, Vin);

H=(io/Vin);

double([abs(H),angle(H)])

ans =
    0.3461    0.3644

%%10.14
clear all
syms Iin v1 v2
[Iin, v1, v2]=solve(Iin==20*exp(j*300*pi/180), v1/(-j*2)+v1/10+Iin+(v1-v2)/
(j*4), v2/(-j*5)+v2/(j*2)-Iin+(v2-v1)/(j*4), Iin, v1, v2);

H=(v1/Iin);
double([abs(H),angle(H)])

H=(v2/Iin);
double([abs(H),angle(H)])

ans =
    1.4463    1.8392
ans =
    2.4583    1.6418

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