15.49 In the circuit of Figure P15.49 let $v_s = 100 \sin 10^4 t$ V. Find the load that will absorb the maximum average power, as well as the power itself.

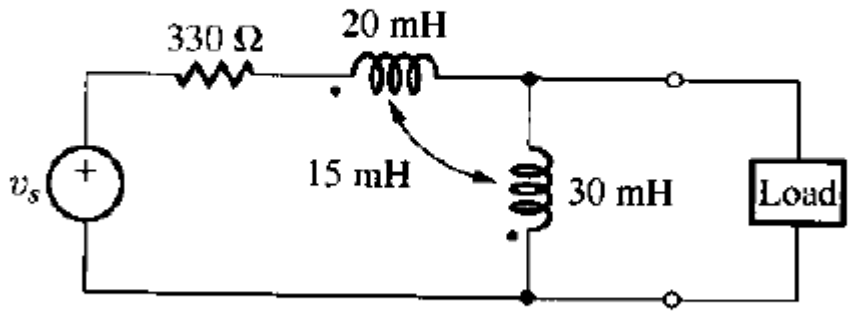

Figure P15.49

```
clc, clear, close all
format short g

vf = 100;
w = 10e4;

z1= 3;
z2 = j*w*1;
z3 = -1/(j*w*1);
z4 = j*w*2;
z5 = 5;

syms i1 i2 i3 i4

If1 = 5; %[A]
If2 = 2; %[A]

ec_restric1 = i2-i1 == If1
```

ec_restric1 = $i_2 - i_1 = 5$

```
ec_restric2 = i3 - i4 == If2
```

ec_restric2 = $i_3 - i_4 = 2$

```
sm1 = simplify((4*(i2-i3))+(3*i2)+(2*i1)+(1*(i1-i3))==0)
```

sm1 = $3\,i_1 + 7\,i_2 = 5\,i_3$

```
sm2 = simplify((4*(i3-i2))+(1*(i3-i1))+(5*i4)==0)
```

sm2 = $i_1 + 4\,i_2 = 5\,i_3 + 5\,i_4$

```
m = [3 7 -5 0;1 4 -5 -5;-1 1 0 0;0 0 1 -1];
n = [0;0;5;2];
h = m\n
```

h = 3×1

```
  250
 187.5
  190
```