```matlab
% Circuits III Lab 2

clear
format SHORT

syms t s

R1 = 4000;
R2 = 10000;
R3 = 5000;

C1 = 0.2*10^-6;
C2 = 0.4*10^-6;

Vc1 = 5;
Vc2 = 5;

vint = [20 + 5*cos(2*pi*200*t)]*heaviside(t);

Vins = laplace(vint,t,s);
pretty(Vins)

A = [(R1+1/(s*C2)+R3) -(1/(s*C2)+R3); -(1/(s*C2)+R3) (R3+1/(s*C2)+1/(s*C1)+R2)];
B = [Vins-(Vc2/s);0];

Soln = inv(A)*B;
simplifyFraction(Soln)

Vos = R2*Soln(2);
pretty(simplify(Vos))

vot = ilaplace(Vos,s,t)
```

```
         5 s          20
   -------------- + --
          2    2    s
   160000 pi  + s

ans =

 (14167099448608935*(s^2 + 120000*pi^2))/(4*(s^2 + 160000*pi^2)*(1298650782789152375*s + 2951
47905179352825856))
   (4722366482869645*(s^2 + 120000*pi^2))/(4*(s^2 + 160000*pi^2)*(1298650782789152375*s + 2951
47905179352825856))


                     /      5 s         15 \
    590295810358705625 s | -------------- + -- |
                     |          2    2    s  |
                     \ 160000 pi  + s       /
    ----------------------------------------------
     1298650782789152375 s + 295147905179352825856
```

```
vot =

(exp(-(295147905179352825856*t)/1298650782789152375)*(93330961610562142533270444372191784933
2406137298583984375*pi^2 + 40173451106474755070624535270107417856322572101091328000000))/(1298
650782789152375*(1054058659774298889027859981855087890625*pi^2 + 34028236692093846346337460740
31768211456)) - (13611294676837537922598199676108800000000*pi*sin(400*pi*t) - 2395587863123406
56597240904967065429687500*pi^2*cos(400*pi*t))/(1054058659774298889027859981855087890625*pi^2 +
 3402823669209384634633746074310768211456)
```

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