Svoboda & Dorf Example Problem 10.8-1
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```
> restart
```

Handy functions for dealing with phasors

```
> j := I:
> polard := (mag, angd) → polar(mag, angd*Pi / 180) :
> argumentd := (num) → argument(num) * 180 / Pi :
> listphasors :=proc(plist) local k
  for k from 1 to nops(plist[ ]) do
  printf("%s = %f < %f deg\n", lhs(plist[ ][k]), evalc(abs(rhs(plist[ ][k]))),
      evalc(argumentd(rhs(plist[ ][k]))))
   end do end proc:
```

Circuit equations

$$> KCLn2 := jomega \cdot C \cdot (Vo - Va) + \frac{Vo}{R} + \frac{(Vo - Vb)}{jomega \cdot L} = 0 :$$

Solve circuit equations

```
> MySoln := solve({KCLn2}, [Vo]) :
> collect(MySoln, jomega)
```

$$\left[\left[Vo = \frac{(C\,L\,Va\,jomega^2 + Vb)\,R}{C\,L\,R\,jomega^2 + L\,jomega + R} \right]\right] \qquad (1)$$

Define lists for elements, then for each frequency independently

```
> ElVals := R = 8,  L = 0.150, C = 0.002 :
> Valsa := ElVals, jomega = j·50, Va = polard(20, 0), Vb = 0 :
> Valsb := ElVals, jomega = j·10, Va = 0, Vb = polard(20, 0) :
```

Find solutions for each frequency

```
> MySolna := subs(Valsa, MySoln) :
> MySolnb := subs(Valsb, MySoln) :
```

Find phasors for each frequency

```
> listphasors(MySolna)
Vo = 15.459759 < 104.931417 deg
> listphasors(MySolnb)
Vo = 20.243825 < -10.940287 deg
>
```

Conclusion:

$$vo(t) = 15.460\cos(50\,t + 104.93\,deg) + 20.244\cos(10\,t - 10.94\,deg)$$