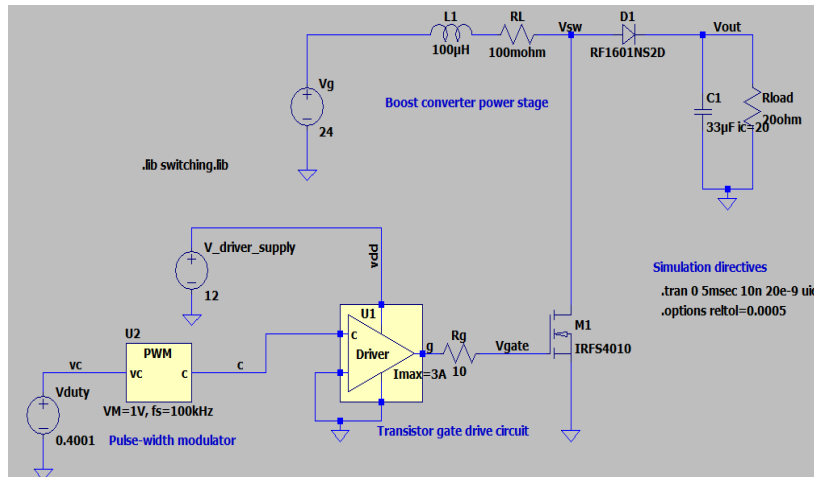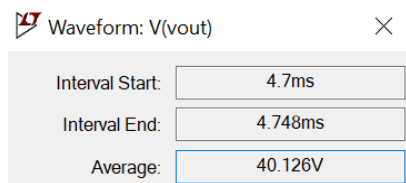# Week 1

Introduction to Power Electronics
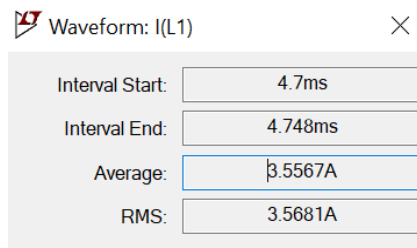

What is the steady-state average output voltage (expressed in volts)?
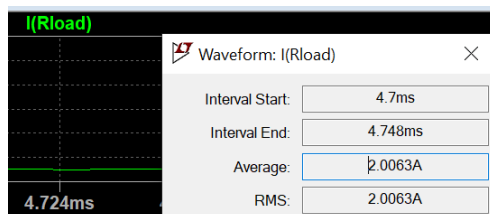


```
Vout = 40.126;
```

What is the steady-state average inductor current (in amps)?


```
iL = 3.55;
```

What is the steady-state output power (in watts)?

Pout = I(Rload) * V(vout)


```
iR = 2.0063;
```

```
Pout = iR*Vout
```

Pout = 80.5048

What is the average power drawn out of the input source Vg during steady-state operation of the converter (in watts)?

Pin = Vg* iL
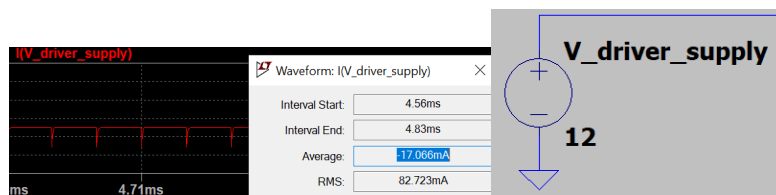
```
Vg = 24;
Pin = Vg*iL
```

Pin = 85.2000

What is the average power consumption of the gate driver (in watts)?


```
idriver = 17.066e-3;
% Probe is in negative direction.
Vdd = 12;
Pgatedriver = idriver*Vdd
```

Pgatedriver = 0.2048

What is the converter efficiency (enter a numeric value between 0 and 1)?

```
eff= Pout/Pin
```

eff = 0.9449

```
% According to grader;eff = 0.946-0.948
```

Now change the control voltage input to the pulse-width modulator, so that it produces a control signal having a duty cycle of 0.6. Run the simulation again. What is the new steady-state average output voltage?

ans = 60