## NOTES SHEET HELP

The following diagrams should help you fill in the more difficult boxes in the notes sheet.
For practice:

- Figure out how each circuit works.
- Write equations based on resistor, capacitor, etc. values.
- See how changing resistance, capacitance, etc. changes the output.
- Determine how the rails of the amplifiers would affect the output.
- Determine if high currents could be created that would "melt" things.
- Rework designs for $\mathrm{V}_{\mathrm{DD}}=3 \mathrm{~V}$ instead of 5 V .
- See how different diode models would affect output.
- Hook these together, either with no purpose in mind, or to design. See what happens.


## SUMMING AMPLIFIER

$$
R_{0}=\infty, \text { all other resistors equal for } V_{1}+V_{2}
$$



All resistors equal for $\mathrm{Vo}=\mathrm{V}_{1}-\mathrm{V}_{2}$


This one is easier to understand, results in

$$
V_{0}=-\frac{1}{R C} \int_{0}^{t} V_{i}(t) d t+V_{C}(0)
$$

Attach inverting amplifier to output to remove negative sign.


HALF-WAVE RECTIFIER


HALF-WAVE RECTIFIER WITH FILTER CAPAPCITOR


FULL WAVE RECITIFIER


## CLIPPER




TRIANGLE WAVE GENERATOR


2-BIT A/D CONVERTER


3-BIT D/A CONVERTER
Resistor values word for $\mathrm{V}_{\mathrm{DD}}=5 \mathrm{~V}$.


