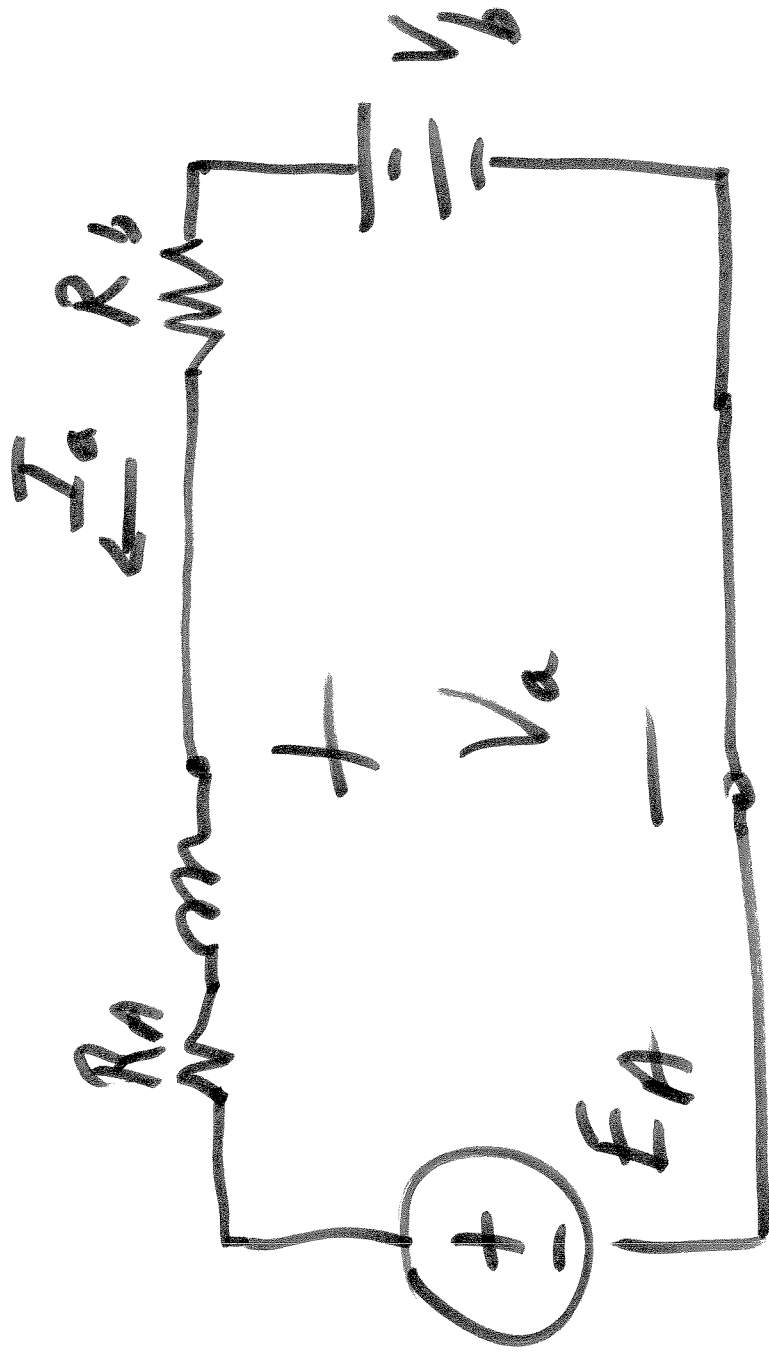
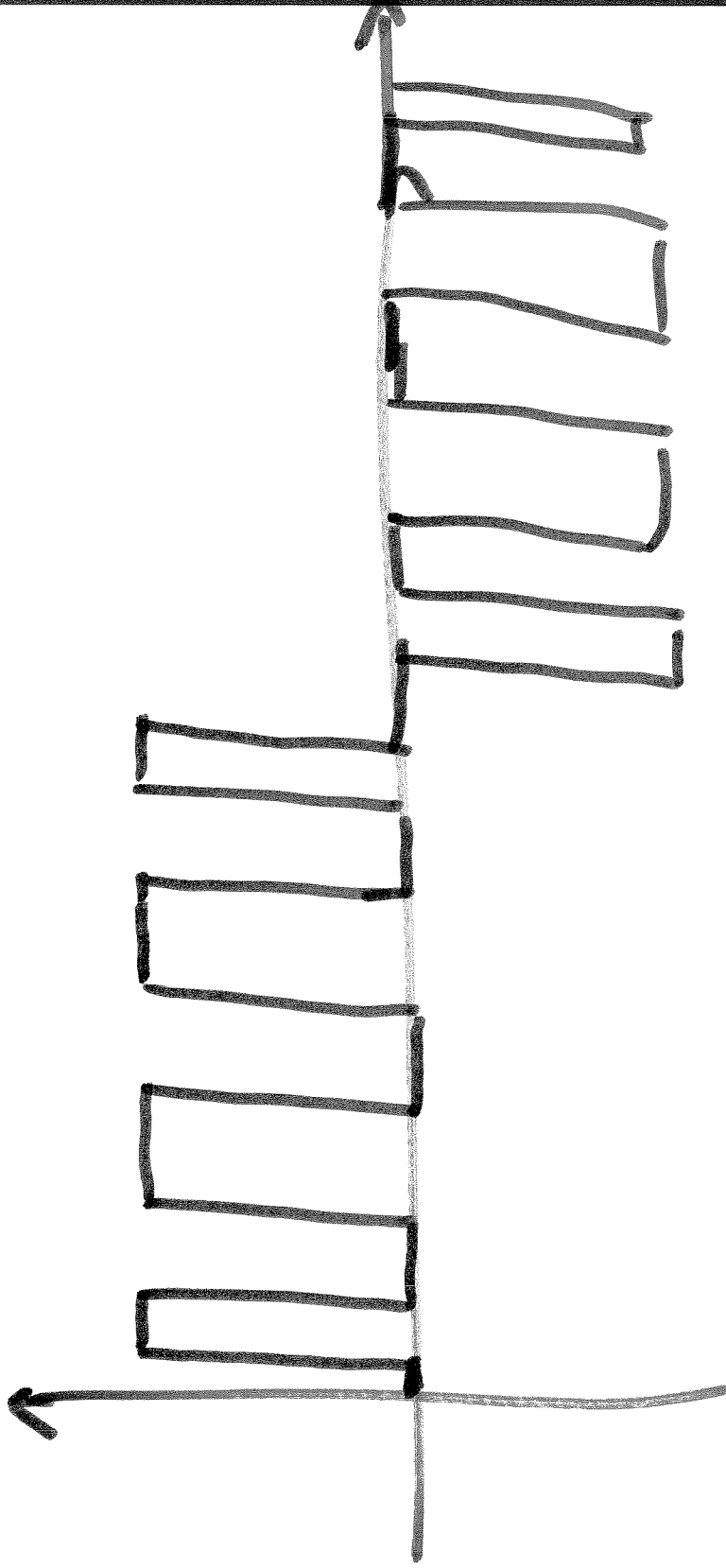


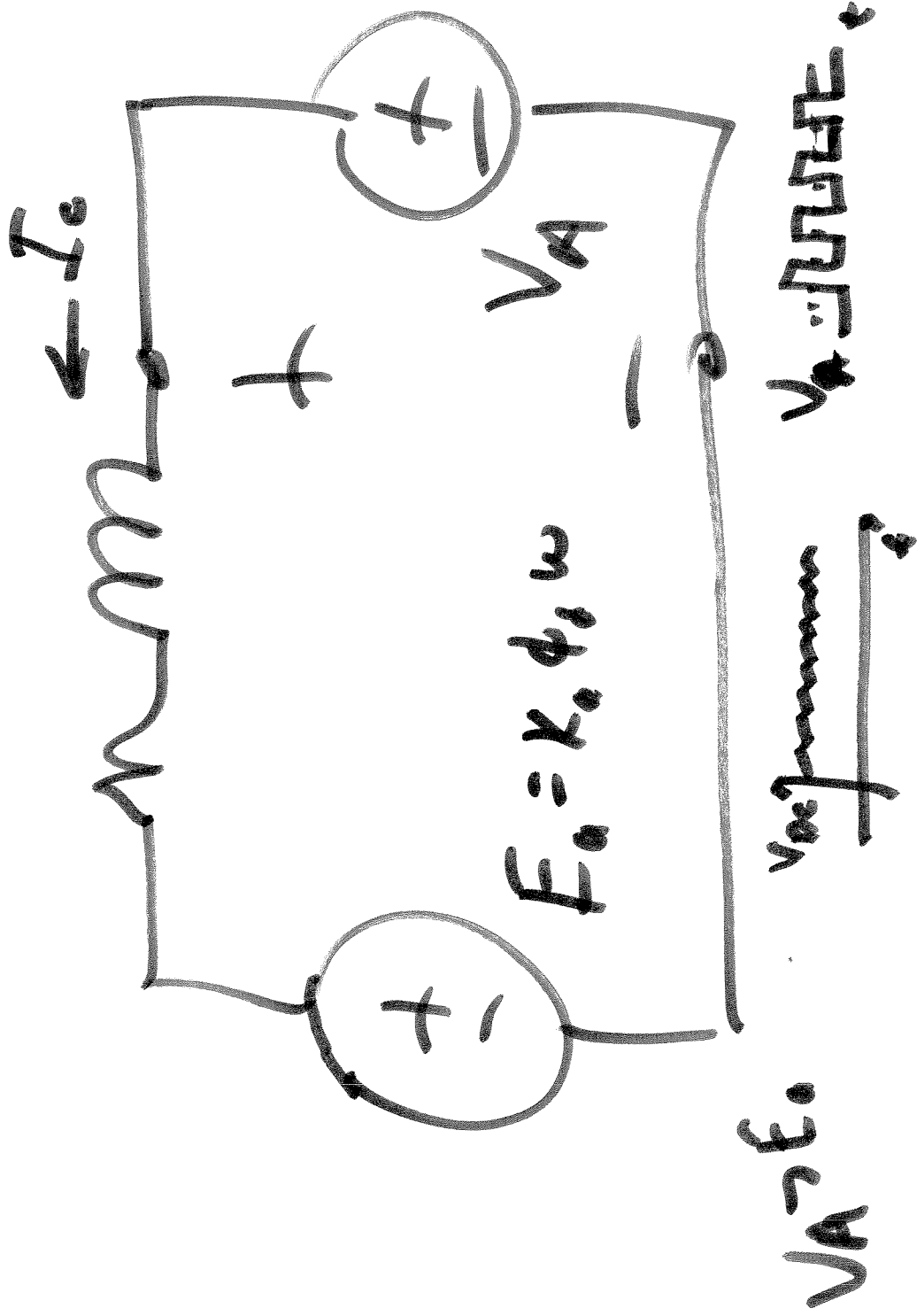
ECE 320 & ECE 329

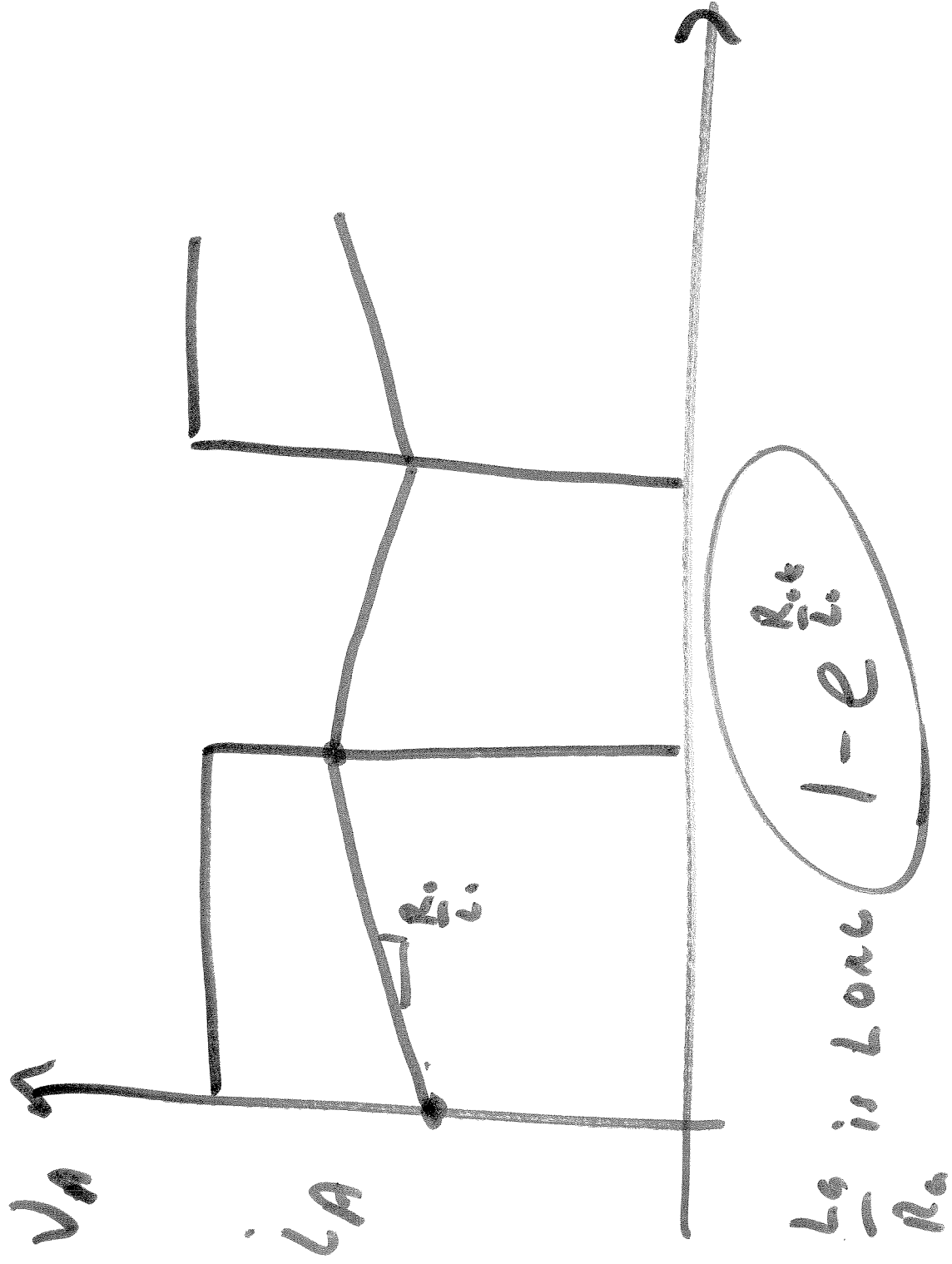
ENERGY SYSTEMS I  
BACKGROUND STUDY IN ENERGY SYSTEMS

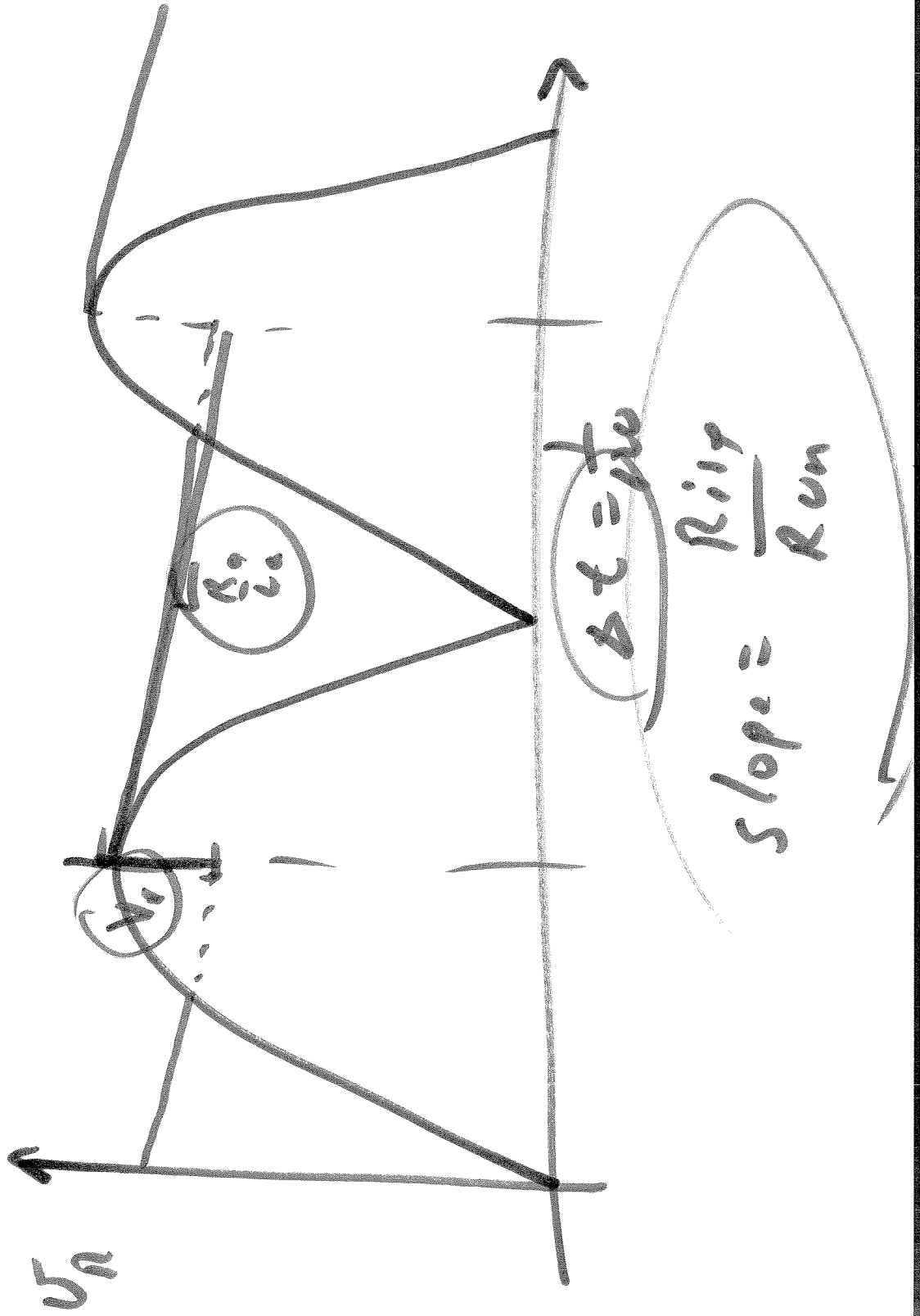
SESSION no. 23





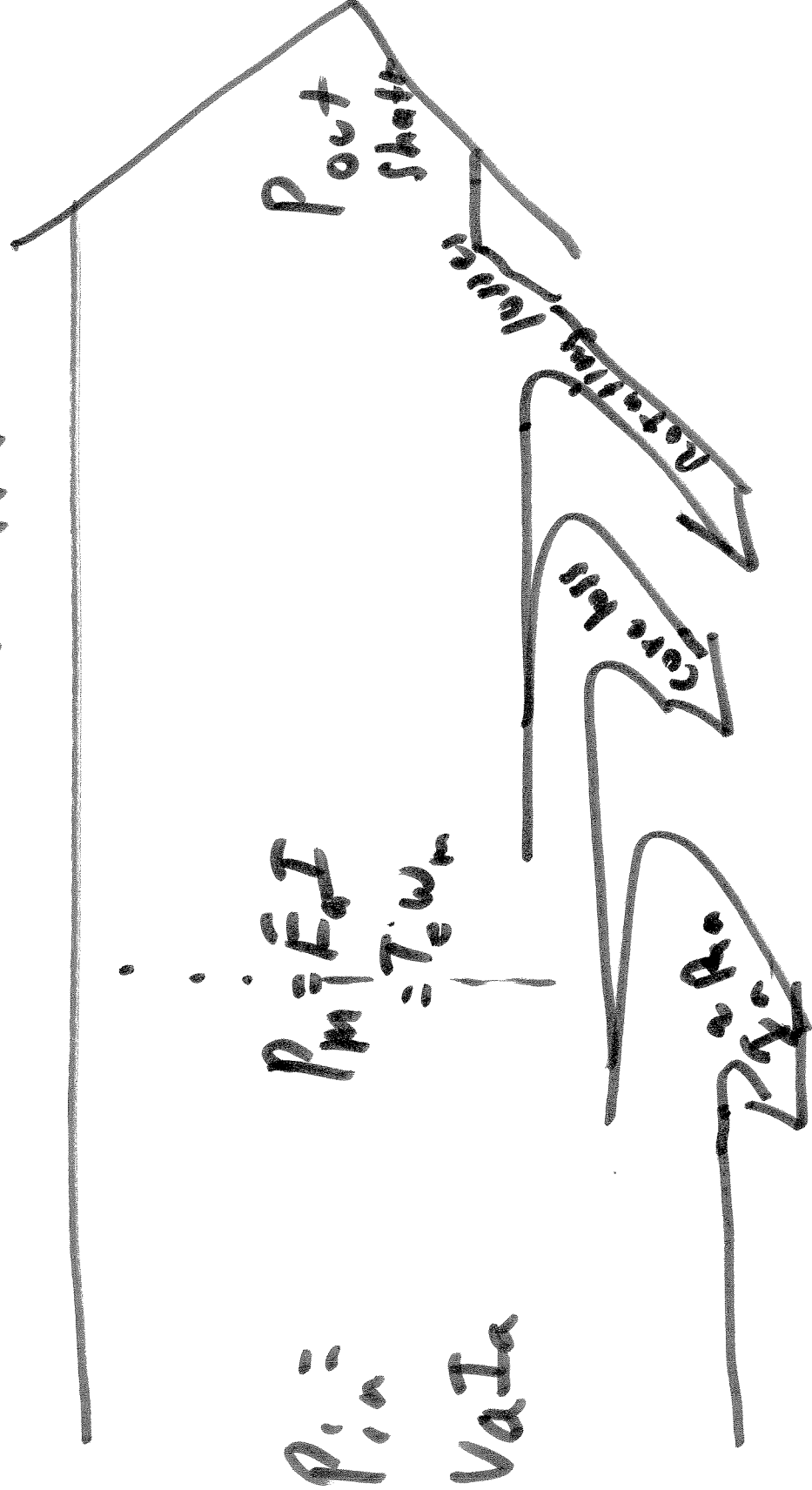






# EFFICIENCY

$$\eta = \frac{P_{out}}{P_{in}}$$



ECE 320 / ECE 329

Energy Systems I

Lesson 23

DC Machines Examples

Separate excited machine

Separate sources for armature (used a battery here) and field (used a magnet here)

Single source inputs:

Series: high starting torque; works on dc or ac;

Parallel (shunt): general purpose machine, generally larger in size than others; Gives variable speed and torque

Separately excited motor: gives variable speed and torque; high performance control