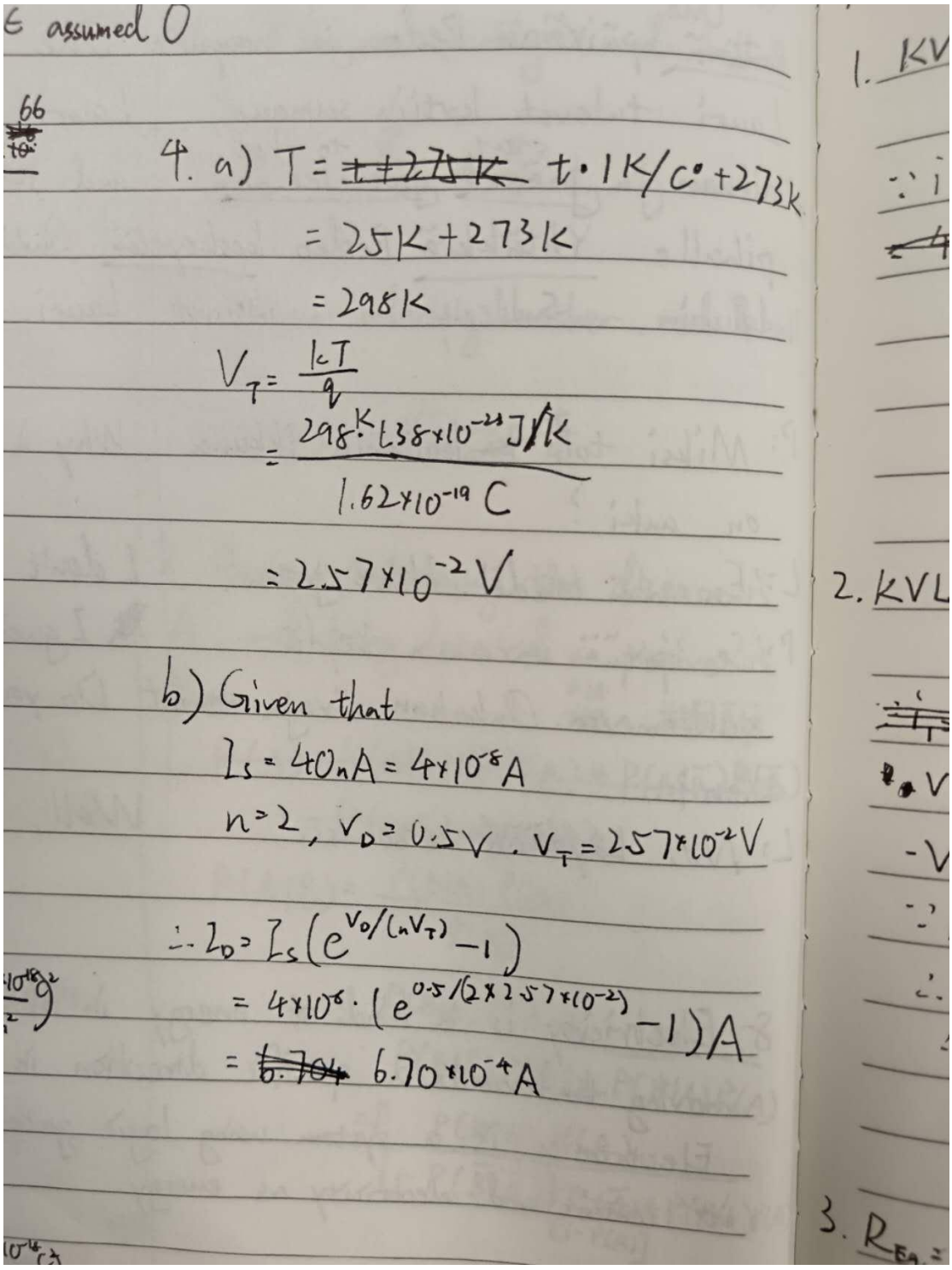
1. N-type semiconductors have free electrons, P-type semiconductors have free holes which act like positive ions.
2. Naturally, P-and N-type semiconductors form a depletion region in the middle space, resulting in an electric field. With a forward-bias, the electric field is weakened or eliminated, allowing electrons to flow through and forming a current. With a reverse-bias, the electric field is strengthened, blocking the electrons to flow through, so there will be almost no current.
3. Being ideal means being simple and easy to calculate. For example, an ideal power supply has no inner resistance, an ideal diode has no voltage drop etc.

4. 

In this lesson, I gained basic understanding of semiconductor and diode, and became familiar with their basic applications.