

### Using MathCad-

**Example-** Plot Fermi-Dirac electron and hole probability functions vs  $E$  (eV) at 725 K for GaAs. Also, plot Maxwell-Boltzmann approximation.

$$k_B_{eV} := 8.617333 \cdot 10^{-5} \quad eV/K$$

From graph (earlier)-  $EF_{725} := 0.8$  eV  $k_B_{eV} \cdot 725 = 0.062476$  eV

$$n := 0..100 \quad E_n := \frac{n}{100} \cdot 1.6 \quad E_{2n} := E_n + EF_{725}$$

$$f_{F725n} := \frac{1}{1 + e^{\left(\frac{E_n - EF_{725}}{k_B_{eV} \cdot 725}\right)}} \quad f_{FMBn} := e^{-\left(\frac{E_{2n} - EF_{725}}{k_B_{eV} \cdot 725}\right)}$$

