Example 1.5 Calculate the energy relative to the Fermi energy for which the Fermi function equals 5%. Write the answer in units of $kT$.

Solution The problems states that:

$$ f(E) = \frac{1}{1 + \exp\left(\frac{E - E_F}{kT}\right)} = 0.05 $$

which can be solved yielding:

$$ E - E_F = \ln(19)kT = 3kT $$