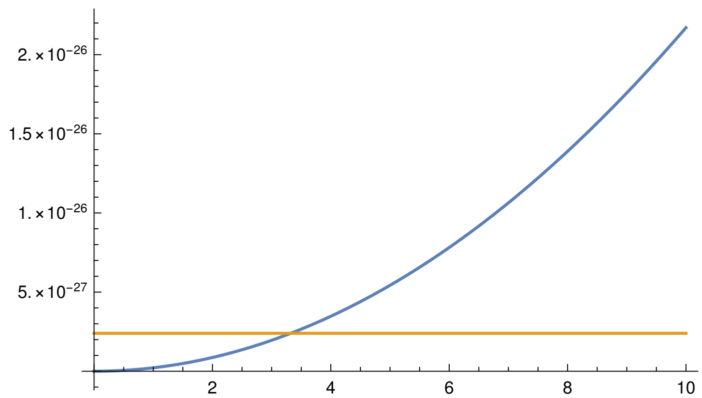
```
gn = 0.404;
B0 = 2.35;
h = 6.626070040 * 10 ^ (-34);
ℏ = h / (2 * π);
qp = 1.6021766208 * 10 ^ (-19);
qn = 7 * qp;
mp = 1.6726219 * 10 ^ (-27);
mn = 14 * mp;
```

$$E2[B\_] := \frac{\hbar * g_n * q_n * B^2}{4 * m_n * B0};$$

$$\omega_0 = \frac{g_n * q_n * B0}{2 * m_n};$$

$$E0[B\_] := \omega_0 * \hbar;$$

```
Plot[{E2[B], E0[B]}, {B, 0, 10}]
```



This calculation shows the sensitivity of the perturbation method as we see once we reach a neighborhood of field strengths near B0, the energy of the correction crosses the zeroth order energy. Below is the plot including the energy of each state to second order:

In[422]:=
```
Plot[{E2[B] + E0[B], -E2[B] - E0[B]}, {B, 0, 10}]
```

Out[422]=