```
itermax = 100;
iterno = 1;
tol = 10e-5;
x_k = 5000;
x_n = 0;
err = 1/0;
while tol < abs(err)
    F1 = f(x_k);
    F2 = fd(x_k);
    x_n = x_k - F1/F2;
    err = abs(x_n - x_k);
    if iterno > itermax
        break
    end
    x_k = x_n;
    iterno = iterno + 1;
end
iterno-1
x_n

function f_d = fd(T_f)
    a_CO2 = 5.316;
    a_H2O = 7.7;
    b_CO2 = 1.4285E-2;
    b_H2O = 0.04594E-2;
    c_CO2 = -0.8362E-5;
    c_H2O = 0.2521E-5;
    d_CO2 = 1.784E-9;
    d_H2O = -0.8587E-9;
    n_f_CO2 = 2;
    n_f_H2O = 3;
    T_i = 298;
    term_1 = (n_f_CO2 * a_CO2 + n_f_H2O * a_H2O);
    term_2 = (n_f_CO2 * b_CO2 + n_f_H2O * b_H2O) * (T_f);
    term_3 = (n_f_CO2 * c_CO2 + n_f_H2O * c_H2O) * (T_f ^ 2 );
    term_4 = (n_f_CO2 * d_CO2 + n_f_H2O * d_H2O) * (T_f ^ 3 );
    f_d = term_1 + term_2 + term_3 + term_4;
end


function f_x = f(T_f)
    a_CO2 = 5.316;
    a_H2O = 7.7;
    b_CO2 = 1.4285E-2;
    b_H2O = 0.04594E-2;
    c_CO2 = -0.8362E-5;
    c_H2O = 0.2521E-5;
    d_CO2 = 1.784E-9;
    d_H2O = -0.8587E-9;
    n_f_CO2 = 2;
    n_f_H2O = 3;
    T_i = 298;
    term_1 = (n_f_CO2 * a_CO2 + n_f_H2O * a_H2O) * (T_f - T_i);
    term_2 = 0.5   * (n_f_CO2 * b_CO2 + n_f_H2O * b_H2O) * (T_f * T_f - T_i * T_i);
    term_3 = (1/3) * (n_f_CO2 * c_CO2 + n_f_H2O * c_H2O) * (T_f ^ 3 - T_i ^ 3);
    term_4 = 0.25  * (n_f_CO2 * d_CO2 + n_f_H2O * d_H2O) * (T_f ^ 4 - T_i ^ 4);
    f_x = term_1 + term_2 + term_3 + term_4 - 341.2617E3;
end
```

```
ans =

     4
```

```
x_n =

    5.4442e+03
```

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