```matlab
%The values are in SI units(except pressure). This is only for ideal
%gas-state. The question solved here is 5.3 from Van Ness and Smith
[no_iter, T] = Cal_T(1.702, 9.081*(10^(-3)), -2.164*(10^(-6)), ...
    0.0, 550, 1.0, 5.0, 0.01,10000)


function [no_iter, T] =  Cal_T(a,b,c,d,T0,P1,P0,max_err,max_iter)
    no_iter =0;
    err = 1/0;
    tou_new = 0;
    tou_ini = 2;%don't take 1
    while err>=max_err
        CP = a + ((tou_ini-1)/log(tou_ini))*(b*T0+((tou_ini+1)/2)* ...
            (c*(T0^2)+d/((tou_ini^2)*(T0^2))));
        tou_new = exp(log(P1/P0)/CP);
        err = abs(tou_new-tou_ini);
        tou_ini = tou_new;
        no_iter = no_iter + 1;
        if no_iter == max_iter
            break
        end
    end
    T = T0 * tou_new;
end


no_iter =

     3


T =

   411.5564
```

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