Find the general solution to the differential equation

$$\frac{dT}{dt} + 0.1T = 0.25t$$

Solution using undetermined coefficients

Try a particular solution of the form $T_p = At + B$.

$$T_p' + 0.1T = A + 0.1At + 0.1B$$

so we want to choose A and B so that

$$0.1At + A + 0.1B = 0.25t.$$

Grouping coefficients of powers of t, we obtain $A = 2.5$ and $B = -25$.

So a particular solution is

$$T_p = 2.5t - 25$$

and the general solution is

$$T_g = 2.5 - 25 + Ce^{-0.1t}$$