Report

(a) (b)

(a) $\text{dom} f = \{x \mid x \in \mathbb{R}^n\}$ is a space $\Rightarrow$ is a convex set

(b)
$$\nabla f(x) = \sum_{i=1}^{m} e^{a_i^T x - b_i} \cdot a_i$$

$$\nabla^2 f(x) = \sum_{i=1}^{m} e^{a_i^T x - b_i} \, a_i a_i^T$$

(c)~(k)
Setting 1:

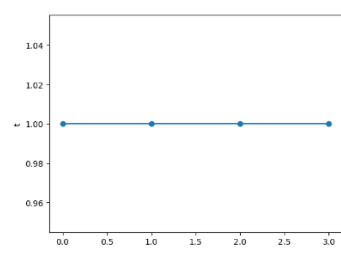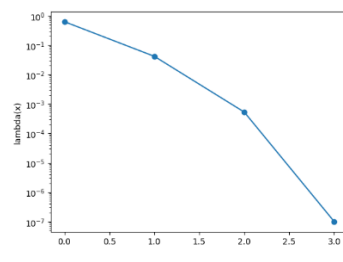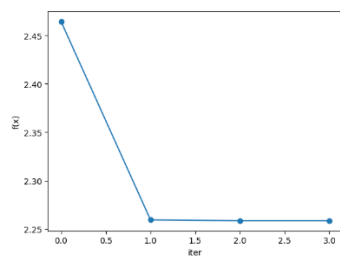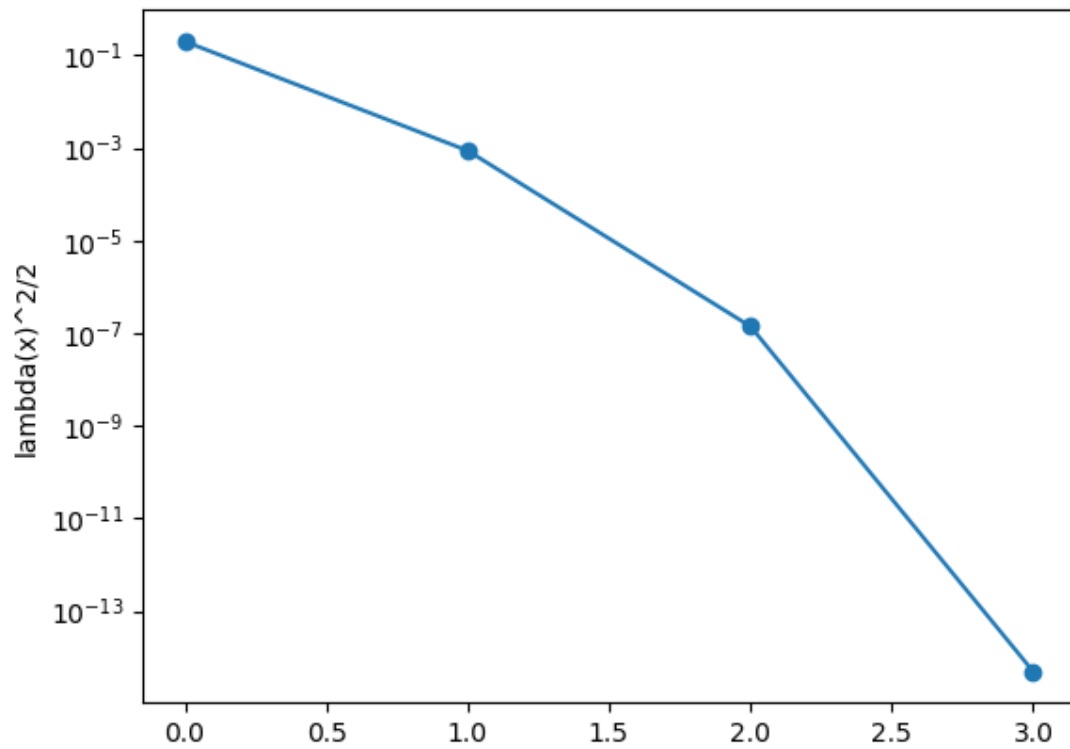| $f(x^{(k)})$	2.7145123	2.5594910	2.5592667
$\lambda^{(k)}$	0.549192564	0.021181067	1.24E-06
$t^{(k)}$	1	1	1
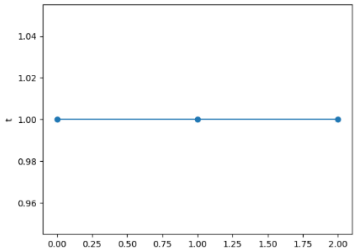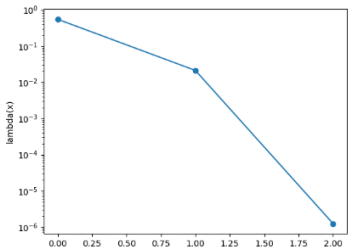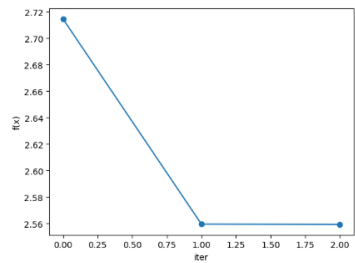
λ²/2 (log scale)
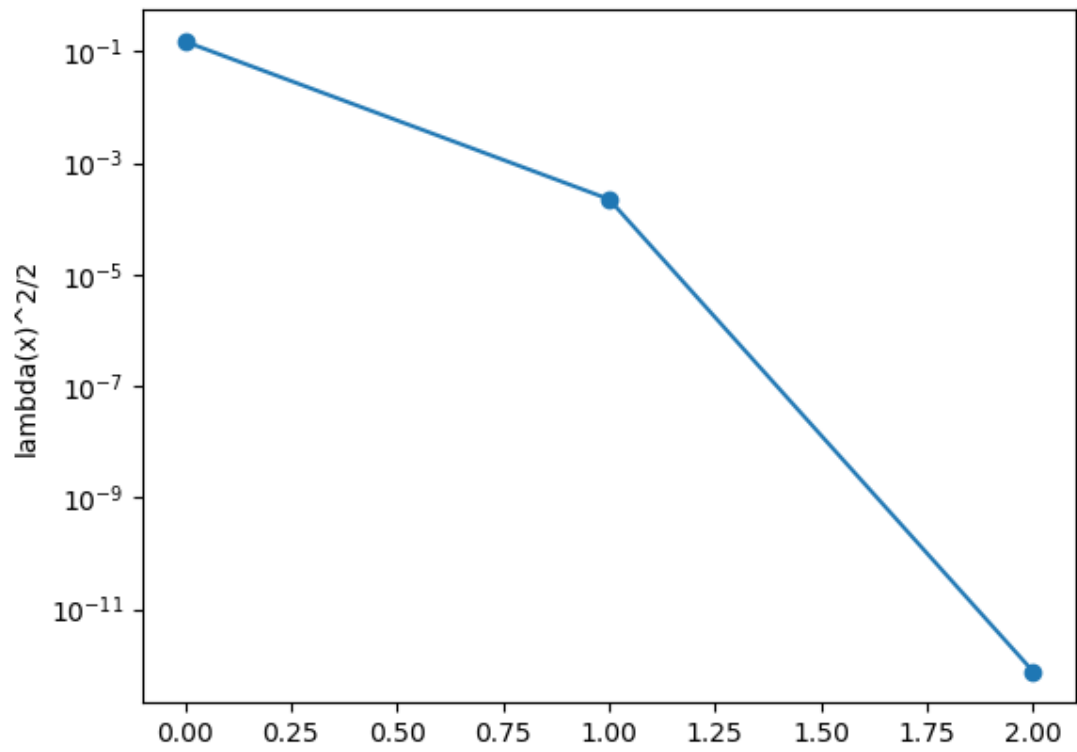
Setting 2:

f(x^{(k)})	2.464386392	2.259416272	2.258545072	2.258545
λ^{(k)}	0.627263461	0.041613379	0.000528507	9.97E-08
t^{(k)}	1	1	1	1

$\lambda^2/2$(log scale)

Both of the settings have optimal value and optimal point close to the output of cvx toolbox

	x1*		x2*		f(x*)	
	mine	cvx	mine	cvx	mine	cvx
setting1	-0.3465736	-3.47E-01	0	-2.19E-17	2.5592667	2.55926668
setting2	-0.4215736	-0.4215736	0.25	0.25	2.25854493	2.25854491