

⑤ $\Rightarrow \frac{1}{1+e^{\theta x_i}}$ is always $0 < \square < 1$ which makes

$\sum_{i=1}^n \left(\frac{1}{1+e^{\theta x_i}} \times \left(\frac{1}{1+e^{\theta x_i}} - 1 \right) \right) < 0 \Rightarrow$ hence the problem is concave and NOT convex