Data Science Calculus and Function Optimization HW

Differentiate the following functions.

1. $f(x) = 2x^4$
2. $f(x) = wx^2 + 5x + 7$
3. $f(x) = (2x + 3)^3$
4. $f(x) = \frac{(8-7x)}{(2x-5)^2}$
5. $f(x) = e^{-\frac{(x-\mu)^2}{2\sigma}}$
6. $f(x) = \sqrt{1 - \sqrt{1 - \sqrt{x}}}$
7. $f(x) = \sum_{k=1}^{4} x^n$

Optimize the following function. State whether the optimum is a minimum or maximum, and state how you know.

8. $f(x) = (2x - 3)^2$