Exercise-1.9: Gaussian distribution has a bell shape. Hence x value that makes its derivative 0 should be its mean (i.e. the maximum).

For the first part of the question we are asked to show $x = \mu$ when

$$\frac{dN(x|\mu,\ \sigma^2)}{dx} = 0$$

When we take this derivative according to x, the result is:

$$-\frac{x-\mu}{\sigma^2} N(x|\mu,\ \sigma^2) = 0$$

It can be observed that only vale for x to make this equation zero is $x = \mu$.

Second part of the question asks us to show $\boldsymbol{x} = \boldsymbol{\mu}$ (bold characters denote vectors; however, I won't write it for sake of simplicity) when

$$\frac{dN(x|\mu,\ \Sigma)}{dx} = 0$$

Similar to first equation, derivation yields:

$$-\frac{x-\mu}{\Sigma} N(x|\mu,\ \Sigma) = 0$$

Possible only when $x = \mu$.