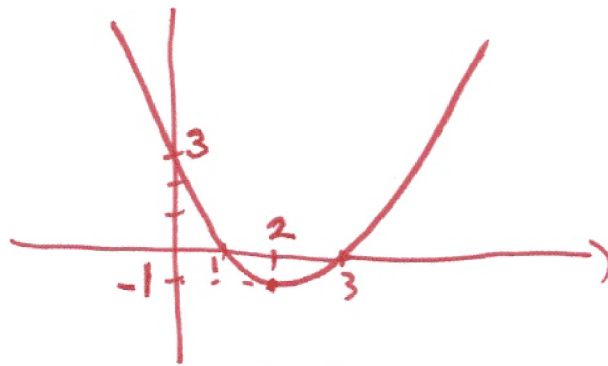


Problem 7: Consider the function $f(x) = 3 - 4x + x^2$. (a) Put it in normal form by completing the squares, (b) sketch its graph and carefully mark all the relevant points, (c) determine if it has a maximum value or a minimum value and if so compute it.

$$\begin{aligned} \text{(a)} \quad f(x) &= 3 + (x^2 - 4x) \\ &= 3 + [(x-2)^2 - 4] \\ &= -1 + (x-2)^2 \end{aligned}$$

(b)



$$\text{VERTEX} = (2, -1)$$

$$\text{Y-INT} = 3$$

$$\text{X-INT} = 1 \text{ \& } 3$$

(c) f HAS MINIMUM VALUE = -1