

6. If $f: R \rightarrow R$ is defined by $f(x) = x^2 - 3x + 2$, write $f(f(x))$.

Sol. We have, $f(x) = x^2 - 3x + 2$

$$\begin{aligned}\therefore f(f(x)) &= f(x^2 - 3x + 2) \\ &= (x^2 - 3x + 2)^2 - 3(x^2 - 3x + 2) + 2 \\ &= x^4 + 9x^2 + 4 - 6x^3 - 12x + 4x^2 - 3x^2 + 9x - 6 + 2 \\ &= x^4 - 6x^3 + 10x^2 - 3x \\ \therefore f(f(x)) &= x^4 - 6x^3 + 10x^2 - 3x\end{aligned}$$