At present Asha's age (in years) is 2 more than the square of her daughter Nisha's age. When Nisha grows to her mother's present age, Asha's age would be one year less than 10 times the present age of Nisha. Find the present age of both Asha and Nisha.

Solution:

Let Nisha's age = x years

Asha's age = $(x^2 + 2)$ years

Number of years after which Nisha will attain Asha's present age = $x^2 + 2 - x$

According to the given condition:

$(x^2 + 2) + (x^2 + 2 - x) = 10x - 1$

$2x^2 - 11x + 5 = 0$

$2x^2 - 10x - x + 5 = 0$

$2x(x - 5) - 1(x - 5) = 0$

$(x - 5)(2x - 1) = 0$

$x = 5 \ or \ x = \dfrac{1}{2}$

If $x = \dfrac{1}{2}$, then Asha's present age $= \dfrac{1}{4} + 2 = 2\dfrac{1}{4}$ years which is not possible

$\therefore$ We reject $x = \dfrac{1}{2}$

Nisha's present age = 5 years

Asha's present age = 25 + 2 = 27 years