Example 4 Find the domain and range of the relation R given by

$$R = \{(x, y) : y = x + \frac{6}{x} ; \text{ where } x, y \in \mathbf{N} \text{ and } x < 6\}.$$

Solution When $x = 1$, $y = 7 \in \mathbf{N}$, so $(1, 7) \in$ R. Again for,

$$x = 2 . \ y = 2 + \frac{6}{2} = 2 + 3 = 5 \in \mathbf{N}, \text{ so } (2, 5) \in \text{R. Again for}$$

$x = 3, \ y = 3 + \dfrac{6}{3} = 3 + 2 = 5 \in \mathbf{N}, \ (3, 5) \in \mathrm{R}$. Similarly for $x = 4$

$y = 4 + \dfrac{6}{4} \notin \mathbf{N}$ and for $x = 5$, $y = 5 + \dfrac{6}{5} \notin \mathbf{N}$

Thus $\mathrm{R} = \{(1, 7), (2, 5), (3, 5)\}$, where Domain of $\mathrm{R} = \{1, 2, 3\}$

Range of $\mathrm{R} = \{7, 5\}$