

**Prove that the square of any positive integer of the form  $5q + 1$  is of the same form.**

**Solution:**

$$\begin{aligned}(5q + 1)^2 &= (5q)^2 + 2(5q)(1) + (1)^2 \\ &= 25q^2 + 10q + 1 \\ &= 5[(5q)^2 + 2q] + 1 \\ &= 5m + 1, \text{ where } m = (5q)^2 + 2q\end{aligned}$$

$\therefore$  The square of any positive integer is of the form  $5q + 1$  is of the form.