Q5. A carpenter was hired to build 192 window frames. The first day he made five frames and each day, thereafter he made two more frames than he made the day before. How many days did it take him to finish the job?

Sol: Here, a = 5 and d = 2

Let the carpenter finish the job in n days.

Then, $S_n = 192$

$$\Rightarrow \quad 192 = \frac{n}{2}[2a + (n-1)d] \quad \Rightarrow \quad 192 = \frac{n}{2}[2 \times 5 + (n-1)2]$$

$$\Rightarrow \quad 192 = n[5 + n - 1] \quad \Rightarrow \quad n^2 + 4n - 192 = 0 \quad \Rightarrow \quad (n-12)(n+16) = 0$$

$$\therefore \quad n = 12$$