Q:The difference between any two cosecutive interior angles of a polygon is 5°.If the smallest angle is 120°,find the number of sides of polygon.

Solution: The interior angles of a polygon are in AP with

$$a = 120$$
$$d = 5$$

The sum of n terms of an AP is given by

$$S = \frac{n}{2}(2a + (n-1)d) \tag{1}$$

Sum of interior angles of AP is given by

$$S = (n-2)180 \tag{2}$$

$$\frac{n}{2}(2a + (n-1)d) = (n-2)180$$
$$\frac{n}{2}(240 + (n-1)5) = (n-2)180$$
$$n(235 + 5n) = 360n - 720$$
$$5n^2 + 235n = 360n - 720$$
$$5n^2 - 125 + 720 = 0$$
$$n^2 - 25n + 144 = 0$$

solving equation we get

$$n = 16, 9$$