If $\frac{a^n+b^n}{a^{n-1}+b^{n-1}}$ is AM between a and b, then the value of n is

a) 0 b) 1 c)2 d) 3

SOLUTION :

Since $\frac{a^n+b^n}{a^{n-1}+b^{n-1}}$ is AM of a and b.

$$\frac{a^n+b^n}{a^{n-1}+b^{n-1}} = \frac{a+b}{2}$$

$$2a^n + 2b^n = a^n + b^n + ab^{n-1} + a^{n-1}b$$

$$a^{n-1}(a-b) = b^{n-1}(a-b)$$

$$\left(\frac{a}{b}\right)^{n-1} = 1 \Rightarrow n-1 = 0$$

$$n = 1$$