Assignment-2

EE:1205 ($SignalsSystems$)
Indian Institute of Technology, Hyderabad

Md Ayaan Ashraf
EE23BTECH11041

Question 11.9.3.22

If the first and the nth term of a G.P. are a and b, respectively, and if P is the product of n terms , prove that $P^2 = (ab)^n$

Solution:

i

Parameter	Description
a	First Term
r	Common Ratio
b	n^{th} term

TABLE 0
Parameter Table 11.9.3.22

$$b = ar^{n-1} \tag{1}$$

$$(ab)^n = (a^2 r^{n-1})^n = a^{2n} r^{n^2-n} \tag{2}$$

$$P = a * ar * ar^2 * .....ar^{n-1} = a^n r^{\frac{(n^2-n)}{2}} \tag{3}$$

$$P^2 = a^{2n} r^{n^2-n} \tag{4}$$

From (2) and (4) $P^2 = (ab)^n$