DISCRETE 11.9.3 Q-4

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Question:

The 4^{th} term of a G.P. is square of its second term, and the first term is -3. Determine its 7^{th} term.

Solution:

Let, first term of this G.P.(X(0)) be a.
Given, the first term is -3.
i.e. a= -3 (given).....(1)
Let r be the common ratio of G.P.
Given that the fourth term of G.P. is square of its second term.

We know n^{th} term of a G.P. can be written as : ar^{n-1}.....(2)

$$X(3) = (X(1))^2 \quad (Given).....(3) \tag{1}$$

substituting (2) in (3),

$$ar^{4-1} = (ar^{2-1})^2 \tag{2}$$

$$ar^3 = a^2r^2 \tag{3}$$

$$r = a \tag{4}$$

$$(from(1)) \quad r = -3.....(4) \tag{5}$$

$$7^{th}term(X(6)) = ar^{7-1} \tag{6}$$

from (1) and (4)

$$X(6) = (-3)(-3)^6 \tag{7}$$

$$X(6) = (-3)^7 = -2187 \tag{8}$$

So 7^{th} term of the G.P. is -2187.

Variable	Description
a	first term of G.P.
r	Common ratio of G.P.
X(n-1)	nth term of the G.P.

TABLE 0
A Table with input parameters