Assignment 11.9.5_1Q

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QUESTION

Show that the sum of $(m + n)^{th}$ and $(m - n)^{th}$ terms of an *A.P.*, is equal to twice the mth terms.

Solution:

PARAMETER	VALUE	DESCRIPTION
$x(0)$	$x(0)$	First term
d	d	common difference
$x(n)$	$[x(0) + nd]u(n)$	General term of the series

TABLE I
PARAMETER TABLE1

For an *AP*,

$$x(n) = [x(0) + nd]u(n) \quad (1)$$
$$\implies x(m + n) + x(m - n) = [x(0) + (m + n)d] + [x(0) + (m - n)d] \quad (2)$$
$$= 2[x(0) + md] \quad (3)$$
$$\therefore x(m + n) + x(m - n) = 2x(m) \quad (4)$$

$x(0)$	0
d	2
m	6
n	2
$x(m + n)$	16
$x(m - n)$	8
$x(m)$	12

TABLE II
VERIFIED VALUES