ASSIGNMENT 2

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1 Problem

If A is a square matrix such that $A^2 = A$, then $(I + A)^3 - 7A$ is equal to
(A) A
(B) $I - A$
(C) I
(D) $3A$

2 solution

$(I + A)^3 - 7A = I^3 + A^3 + 3I^2A + 3IA^2 - 7A$

$= I + A^2A + 3IA + 3IA - 7A$

$= I + AA + 6IA - 7A$

$= I + A^2 + 6A - 7A$

$= I + A + 6A - 7A$

$= I + 7A - 7A$

$= I$

3 Answer

$(I + A)^3 = I$
option C is the valid answer