

Homework 1: Induction I

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April 8, 2018

Problem 1.

Show that

$$1 + 4 + \dots + (3n - 2) = \frac{n(3n - 1)}{2}$$

Problem 2.

Show that $n^3 + (n + 1)^3 + (n + 2)^3$ is divisible by 9 for any positive integer n .

Problem 3.

Show that the number $5^{2n+1} + 2^{2n+1}$ is divisible by 7 for all nonnegative integers n .