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CSIS 213-3941

Assignment 5&6 Quiz Part 2

**Question 5**

Prove or disprove that, if we add three consecutive integers, their sum is divisible by 3.

**Proof:**

Suppose *a, b, c* [particular but arbitrarily chosen] are three consecutive integers. Let *a* = k, *b* = k + 1, *c* = k + 2. The sum of these three integers is divisible by three by the definition of *n mod d*. Thus,

*a* + *b* + *c*

k + (k + 1) + (k + 2)

3k + 3

Let *n* = 3k + 3 and *d* = 3 [sum divisible by]. By using *n mod d* the original integer is the result. Hence,

*n mod d* = k

a = k

Therefore, adding three consecutive integers will result in a sum that is divisible by 3.