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CSIS 213-3941

Assignment 5&6 Quiz Part 2

**Question 3**

Determine whether the following statement is true or false. Justify your answer with a proof or a counterexample, as appropriate.

**If we multiply an odd integer with an even integer, the result is even.**

**Proof:**

Suppose *m* is an odd integer and *n* is an even integer [must show that *mn* is even]. Then by definition of the sum of two even integers is even. Thus,

*m* = 2k + 1

*n* = 2k

*mn* = (2k + 1) \* 2k

= 4k^2 + 2k

Let y = 4k^2. Then *y* is an even integer because the square of an even integer is even. Thus,

*mn* = *yn*

Therefore, *mn* results in an even integer by definition of the sum of two even integers is even.