

Name:

Problem 1: *True or false: For positive integers m and n ,*

$$(m + n)! = m! + n!$$

If you answer “True,” please provide a proof. If you answer “False,” please provide a counter-example.

Solution: This is false, and almost every pair (m, n) will give a counter-example. Here is just one: $m = 2, n = 3$:

$$(2 + 3)! = 5! = 120 \neq 8 = 6 + 2 = 3! + 2!$$