Miguel Flores-Acton September 16, 2024

6.1200 Problem Set 1

Problem 1 *(Collaborators: None)*

Part 1(a)

Ten people is too many people, so it violates policy.

Part 1(b)

This is most likely working too closely together because you are both typing your solutions together which violates collaboration policy.

Part 1(c)

This also counts as working too closely together and also, your reciting the solution to your friend which is not allowed.

Part 1(d)

This is not ok, because you cannot help others given that you've already done and completed the assignment.

Part 1(e)

It is not allowed to share any part of your solution with someone else.

Part 1(f)

Again, it is not allowed to share your answer with someone else.

Part 1(g)

It's not allowed to refrence previos work whether yours or not for the class.

Part 1(h)

As you are just copying an answer and not deriving it yourself, this is not allowed.

Part 1(i)

Similar to the last situation, you or your peers are not deriving the solution, just copying it so it is not allowed.

Part 1(j)

Just as it is not allowed to look at the answer from others, it is not ok to look at answer the answer before completing your assignment.

Problem 2 *(Collaborators: None)*

Part 2(a)

A	B	C	B→C	A→(B→C)
0	0	0	1	1
0	0	1	1	1
0	1	0	0	1
0	1	1	1	1
1	0	0	1	1
1	0	1	1	1
1	1	0	0	0
1	1	1	1	1

A	B	C	(A→B)	(A→C)	((A→B)→(A→C))
0	0	0	1	1	1
0	0	1	1	1	1
0	1	0	1	1	1
0	1	1	1	1	1
1	0	0	0	0	1
1	0	1	0	1	1
1	1	0	1	0	0
1	1	1	1	1	1

Part 2(b)

If A is false, P := false→(B→C), which is always true. Also, Q := (false→B)→(false→C), which is true→true which is true. Therefore P = Q = true when A is false.

If A is true, P := true→(B→C) which is P := B→C
Q := (false→B)→(false→C) which equals Q := B→C
Therefore Q = P = B→C when A is true.

Problem 3 *(Collaborators: David Santana, Riley Davis)*

Part 3(a)

$$\forall n \exists a \exists b \exists c \exists d . n = a^2 + b^2 + c^2 + d^2$$

Part 3(b)

$$\forall n \exists a \exists b \exists c . (n > 2) \wedge (n = 2 * a) \wedge (n = b + c) \wedge \text{isPrime}(b) \wedge \text{isPrime}(c)$$

Part 3(c)

$$\forall n \exists x \exists y \exists z . (n > 2) \wedge (x^n + y^n = z^n)$$

Part 3(d)

$$\forall n \exists a . \text{isPrime}(n) \wedge (a > n) \wedge \text{isPrime}(a)$$

Part 3(e)

$$\forall n \exists a . (n > 1) \wedge (n < a < 2 * n) \wedge \text{isPrime}(a)$$