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Individual Assignments #58

Assignment:  5.1: 8, 12, 16, 24, 26, 42, 46, 60

# Q8

26\*25\*24 = 15600

# Q12

26 + 25 + 24 + 23 + 22 + 21 + 20 +Empty string = 128

# Q16

13 possible combinations of at least 3 x’s in four digits.

# Q24

1. 10\*9\*8\*7 = 5040
2. 10^4/2 = 5000
3. 4

# Q26

263\*103\*2 = 35152000

# Q42

A = bit string of length 7, |A| = 27

B = begins with 2 0’s, |B| = 25

C = ends with 3 1’s, |C| = 24

B + C = 25+24 = 48

# Q46

|A| = 38 (CS students including joint students)  
|B| = 23 (MTH students including joint students)  
|A ∩ B| = 7 (joint students)

|A| +|B| -|A ∩ B| = 38+23-7 = 54

# Q60

P = n1 is first way to do a task and n2 is a second way.  
Q = n1n2 ways to do the procedure

Let P(m) be product rule for m tasks. The base case m=2 which is the definition of the product rule for two tasks, so that checks out. The inductive case assumes P(m) is true and implies P(m+1). Consider m+1 tasks which can be done n1\*n2\*…\*nm\*nm+1 ways. By the Product Rule for two tasks the number of ways to do this task it the product of the first m number of ways multiplied by the m+1 # of ways. By induction it is proven.