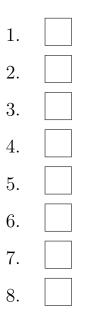
MAT 258 Quiz 2 Answer Sheet

May 22, 2023

Quiz ID: WHK

Name: _____



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MAT 258 Quiz 2

1. How many bit strings of length 7 contain both of the substrings 0110 and 1001 ?a) 8b) 16c) 6d) 10e) 12

2. A task consists of lining up 6 people from left to right and then placing a penny, a nickel, a dime, and a quarter into the left or right pocket of 4 of these 6 people. In the end there will be exactly one coin in exactly one pocket of exactly 4 of the 6 people, who are standing in order from left to right. In how many different ways can this task be performed?

- a) $(6!4!)^2$ b) $(6!)^2 2^4$ c) $(6!2^4)^2$ d) $(6!)^2 4!$ e) $(6!)^2 2^3$
- 3. How many strings of length 7 are there, whose characters are chosen from the digits 0,1, and 2, if each digit occurs at least twice?

a) 500 b) 720 c) 520 d) 630 e) 600

- 4. How many different functions are there from $X = \{1, 2, 3, 4\}$ to $Y = \{5, 6, 7\}$? a) 81 b) 89 c) 85 d) 80 e) 84
- 5. How many different surjective (onto) functions are there from $X = \{1, 2, 3, 4\}$ to $Y = \{5, 6, 7\}$? a) 45 b) 30 c) 36 d) 80 e) 56
- 6. How many solutions does the equation $x_1 + x_2 + x_3 + x_4 + x_5 = 7$ have with integers $x_i \ge 0$? a) 500 b) 384 c) 424 d) 104 e) 330
- 7. How many solutions does the equation x₁ + x₂ + x₃ + x₄ + x₅ = 7 have with integers x_i ≥ 0 and assuming that each x_i ≤ 2? (Hint: first think of how many x_i must equal 2.)
 a) 64 b) 30 c) 84 d) 24 e) 40
- 8. What is the cardinality of $A \cup B \cup C$ if A and B are disjoint, $|A \cap C| = 4$, $|B \cap C| = 6$, and |A| = |B| = |C| = 10? a) 28 b) 20 c) 24 d) 18 e) 30