Name: _____

Math 123-02
Spring 2026
Dr. Lily Yen

Assignment 1
Show all your work
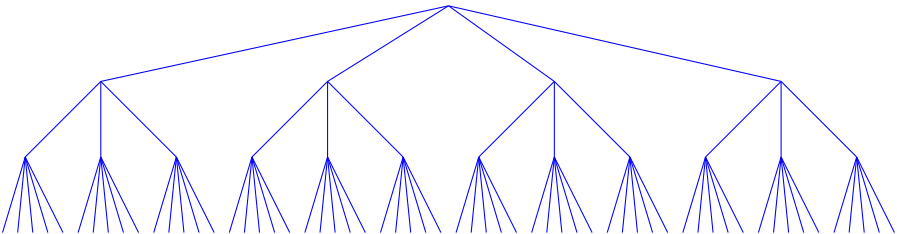
Number: _____

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Score: ___/10

Problem 1: Draw a tree diagram to help you count the number of different open sandwiches (made of one slice of bread, one patty, and one condiment), given that there are four kinds of bread, three kinds of patties , and five kinds of condiments.

Score: /3

Problem 2: Mei has a 3.6 m wire to cut into three pieces for a project. Suppose the longest piece is three times as long as the shortest piece, and the medium piece is the average of the longest and shortest pieces, find the length of each piece.

Suppose the length of the shortest piece is x. Then the longest has length $3x$, and the middle piece has length $\frac{x+3x}{2} = 2x$.

Therefore $x + 2x + 3x = 3.6$ m, so $6x = 3.6$ m, so $x = \frac{3.6 \text{ m}}{6} = 0.6$ m. The three lengths are therefore

$$x = 0.6 \text{ m}, \quad 2x = 1.2 \text{ m}, \quad \text{and} \quad 3x = 1.8 \text{ m}.$$

Score: /3

Problem 3: Below is a 3×3 magic square: using all whole numbers from 1 to 9 exactly once, fill the square such that the row sum, column sum, and diagonal sum are all equal.

2	9	4
7	5	3
6	1	8

We find the sum of the first 9 consecutive positive integers is 45, so $45 \div 3 = 15$, the row sum, column sum, and diagonal sum. The number 5 is the middle number, so should be placed in the middle of the square. The middle column, middle row, and two diagonal sums need to use all four pairs of remaining 8 integers adding to 10 for each pair. When 1 and 9 are placed in one of the diagonals, it is impossible to find four remaining integers such that 1 and two other integers could add to 15 for both the row and the column sums involving 1. This forces 1 and 9 to be in a middle column or a middle row. Once this is done, the other digits can find their places.

Score: /4