

KU Mathematics and Statistics Awareness Month Competition

University of Kansas, Department of Mathematics



Examination for 3rd-5th Grades 2022

INSTRUCTIONS:

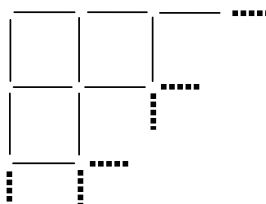
- You have **40 minutes** for the **five problems**.
- Show all of the necessary work and **provide a complete justification for each answer**.
- Solve **each problem on a separate sheet** of paper.
- Enclose each **final answer in a box**.
- You are allowed to use a calculator.
- You are not allowed to borrow or interchange calculators during the test.

The **Academic Code of Honor** applies to this exam. By participating in this exam you agree to the following: *As a participant of the 2022 Mathematics and Statistics Awareness Month Competition, I will not participate in or tolerate academic dishonesty.*

Problem 1. Timmy is helping his grandfather on his chicken farm. Timmy has to pack 66 eggs into cartons, minimizing the packing cost. He can use 12-egg cartons and 6-egg cartons. Two 12-egg cartons cost as much as three 6-egg cartons. How many 12-egg and 6-egg cartons should Timmy use to pack 66 eggs in the cheapest way?

Problem 2. The sum of the digits in the number 994 is $9 + 9 + 4 = 22$. How many 3-digit even numbers are there that have 24 as the sum of their digits?

Problem 3. Toothpicks are used to make a grid that is 10 toothpicks long and 5 toothpicks high. How many toothpicks are used altogether?



Problem 4. What are the last two digits of the product $6 \times 6 \times 6 \times \cdots \times 6$ where the factor 6 appears 99 times?

Problem 5. A 64 inch board is to be cut into n equal pieces of integer length. Furthermore, an 88 inch board is to be cut into the same number n of equal pieces of integer length. What is the largest possible value of n ?