Problem of the Week

Week 9, due Mar 23rd 11.59pm

NAME: _____

NAU Email: _____

Instructor: _____

Please write clean, neat and complete solutions to the problem in order to receive full credit. Your job is to convince me, or really anybody who reads this document, that you understand the problem and are able to communicate what you are thinking about. Please submit your solutions through Gradescope(https://www.gradescope.com/) by the indicated deadline. You might need to create an account with your NAU email. To enroll into the Problem of the Week course use entry code: NYZ56P. Good luck and have fun! NO CHATGPT, etc. IS ALLOWED WHEN WORKING ON THE PROBLEM.

PROBLEM. A positive integer n is called *cute* if for every positive divisor a of n, $a+1$ is a divisor of $n+1$. For example, 2 is not cute, because 1 is a divisor of 2, but 2 is not a divisor of 3. On the other hand, 1 and 3 are the only divisors of 3 and 2 and 4 divide 4, so 3 is cute. Find all cute numbers.

You are allowed to look up basic definitions and theorems from number theory, but NO CHATGPT, etc. IS ALLOWED WHEN WORKING ON THE PROBLEM.