Problem of the Week

Week 6, due Oct 6th 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!

Problem. Misha's triangle

I was playing around with some numbers recently, as one does, and built the following triangle:

$$\begin{array}{ccccccc} & & & 1 & & & \\ & & 1 & 1 & 1 & & \\ & 1 & 2 & 3 & 2 & 1 & \\ 1 & 3 & 6 & 7 & 6 & 3 & 1 \\ & & & \vdots & & & \end{array}$$

1) What is the pattern that I used to build it?

2) Is it true that if I continue the pattern, there will always be an even number in every row? If so, prove it, if not, which row exactly only contains odd numbers?

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