Problem of the Week

Week 13, due Nov 24th 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. If you've taken MAT 137 Calc 2, you might've heard that the harmonic series $1+\frac{1}{2}+\frac{1}{3}+\frac{1}{4}+\cdots$ diverges. What this means is that for any real number M (no matter how big), you can find a sufficiently large n, such that

$$1+\frac{1}{2}+\frac{1}{3}+\frac{1}{4}+\cdots+\frac{1}{n}>M.$$

It's all fun and all, but can $1+\frac{1}{2}+\frac{1}{3}+\frac{1}{4}+\cdots+\frac{1}{n}$ ever be an integer, for any $n \geq 2$? If yes, find such n, otherwise prove no such n exists.

Problem of the Week

Week 11, due Nov 24th 11.59pm

NAME: ____________________

NAU Email: ____________________

Instructor: ____________________

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