Name: _____
MATH 101
Fall 2023
HW 1: Due 09/11

"I'm fine. It's just that life is pointless and nothing matters and I'm always tired."
–Andy Dwyer, Parks and Recreation

Problem 1. (10pt) Complete the following:

(a) List all the divisors of 80.

(b) List all the nonnegative multiples of 15 less than 180.

Problem 2. (10pt) Showing all your work, find the prime factorizations of the following:

(a) 40

(b) 90

(c) 97

(d) 99

(e) 228

Problem 3. (10pt) Without using a calculator, answer the following:

(a) Does 2 divide 8455? Explain.

(b) Does 3 divide 19436? Explain.

(c) Does 4 divide 764136? Explain.

(d) Does 5 divide 99999? Explain.

(e) Does 9 divide 331443? Explain.

Problem 4. (10pt) Complete the following:

(a) List all the prime numbers up to 34.

(b) Compute $\sqrt{1223}$.

(c) Using (a) and (b), explain why 1223 is a prime number.

Problem 5. (10pt) Showing all your work, compute the following:

(a) $\gcd(15, 33)$

(b) $\mathrm{lcm}(15, 33)$

(c) $\gcd(2^{70} \cdot 3^{40} \cdot 7^{60} \cdot 11^{20},\ 2^{90} \cdot 5^{48} \cdot 7^{50} \cdot 11^{20})$

(d) $\mathrm{lcm}(2^{70} \cdot 3^{40} \cdot 7^{60} \cdot 11^{20},\ 2^{90} \cdot 5^{48} \cdot 7^{50} \cdot 11^{20})$

Problem 6. (10pt) Isabella has two large wood strips. One is 70 ft long and the other is 98 ft long. She needs to cut them down into boards. The size of the boards does not matter, so long as they are all of equal size. She has a 'template' that will let her cut the wood to specific integer lengths, but it must be reset if you change the length—which is time consuming. To what length should she set the template in order to never have to reset it and cut each strip into pieces of equal length?