

None of the problems on this assignment are graded. Instead, after completing it, please fill out the associated Google form. That form is the only graded component.

Exercise 1. *Use the seive of Eratosthenes to find all of the prime numbers from 0 to 100. This might seem daunting, but you will soon realize that it wont take too long.*

Exercise 2. *Fundamental theorem of arithmetic: find the prime factors of all of the following:*

- 10
- 26
- 96
- 60
- 1890

Exercise 3. *Determine if the following numbers are or aren't prime using Wilson's theorem (they may seem abvious, but show them with wilson's theorem specifically):*

- 5
- 9
- 11

See why I chose such small numbers?

Exercise 4. *Determine if the following numbers are or aren't prime using Fermat's little theorem.*

- 17
- 19
- 21

Exercise 5. *Determine the Euler totient function $\varphi(n)$ for the following numbers:*

- 12
- 26
- 35

Exercise 6. *For the following choices of a and n show that Euler's theorem holds, and if it doesn't explain why.*

Exercise 7.

$$a = 3, n = 5$$

$$a = 2, n = 7$$

$$a = 14, n = 21$$

$$a = 1, n \in \mathbb{Z} \text{ (} n \text{ is any integer)}$$

Bonus

Exercise 8. *To find all of the prime numbers between 0 and some integer n ,*