

Questions:

1. Required questions (100 points)

- (a) Determine whether 227 and 79 are relatively prime. (20 points)
- (b) Without calculating anything, by simply looking at the numbers, can you tell whether 7932 has a multiplicative inverse mod 11958? Explain. (10 points)
- (c) Calculate $227^{54996213} \bmod 21$ as efficient as possible. (40 points)
- (d) Show the steps of how to calculate $\phi(730)$. (30 points)

2. Optional questions

Find the multiplicative inverse of 79 mod 229.