

**MATH 115: ELEMENTARY NUMBER THEORY
HOMEWORK # 7**

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Homework #7 (Due August 9):

- §8.1: 2, 4, 7;
8.1A: The following ciphertext was generated using a simple substitution algorithm:
53ddc305)6*;4826)4d.)4d);806*;48c8p60))85;;]8*;:d*8c83
(88)5*c;46(;88*96*?;8)*d(;485);5*c2:*d(;4956*2(5*-4)8p8*
;4069285);)6c8)4dd;1(d9;48081;8:8d1;48c85;4)485c528806*81
(d9;48;(88;4(d?34;48)4d;161;;:188;d?;

Decrypt the message.

[Hints: The most frequently occurring letter in English is e. Therefore, the first or second (or perhaps third?) most common character in the message is likely to stand for e. Also e is often seen in pairs. Try to find a character in the ciphertext that decodes to e. The most common word in English is the. Use this fact to guess the characters that stand for t and h. Decipher the rest of the message by deducing additional words.]

- §8.4: 2, 3, 4, 8
- §4.6: 1(c)
- §11.1: 2(a)–2(c), 5, 7, 10, 12, 27
- §11.2: 1(a)–1(b), 3, 4