

## **Week 10 Friday**

Make sure you're sitting next to someone!

# Review

1. What is the order of 5 mod 11?

(A) 1

(B) 2

(C) 5

(D) 10

**Follow-up.** Is “None of the above” even possible?

2. Three dice are rolled simultaneously, but two of them fall off the table. The one that landed on the table landed on 6. What is the probability that, when you look under the table, you'll find that the sum of the values on all three dice is 17?

3. Is 21 is a strong probable prime to base 2?

(A) Yes

(B) No

4. Alice and Bob agree to use affine encryption with  $a = 3$  and  $b = 8$ . What is the decryption of the ciphertext letter B?

5. On a distant alien planet, 10% of the population has a genetic condition which causes them to spontaneously combust at the age of 37. A test for this genetic condition given at birth has a 20% false positive rate and a 5% false negative rate.

Qwtqwt is a newborn alien on this planet who has just tested positive for this genetic condition. What is the probability that he will spontaneously combust at age 37?

6. Eve has just intercepted a ciphertext with index of coincidence 1.3. Which of the following ciphers may have been used to encrypt this ciphertext?

- (A) Rectangular transposition
- (B) Affine cipher
- (C) Playfair cipher
- (D) Caesar cipher



7. Amélie rolls a six-sided dice. If it's 3 or less, she loses \$1. If it's a 4, nothing happens. If it's 5 or more, she wins \$2.

Which of the following is most accurate?

- (A) Amélie is expected to lose money
- (B) Amélie is expected to break even
- (C) Amélie is expected to win money