

1. Does 17 divide 357?

2. Prove or disprove that if $a \mid bc$, where a , b , and c are positive integers, then $a \mid b$ or $a \mid c$

3. What are the quotient and remainder when
 - a) 1001 is divided by 13
 - b) -111 is divided by 11

4. Find the values of
 - a) $4+5$ in Z_7
 - b) $8 \cdot 5$ in Z_7
 - c) $2+3+8$ in Z_9

5. compute (do not use a calculator)
 - a) $(167^{14} + 87^{13}) \bmod 5$
 - b) $(11 \cdot (-25) + 11) \bmod 6$
 - c) $32^8 \bmod 6$

6. A parking lot has 31 visitor spaces, numbered from 0 to 30. visitors are assigned parking spaces using the hashing function $h(k) = k \bmod 31$, where k is the number formed from the first three digits on visitor's license plate.

a) Which spaces are assigned by the hashing function to cars that have these first three digits on their license plates? 317, 918, 007, 110, 111, 310

b) What can you advise the visitors when the space they are assigned is occupied?

7. What sequence of pseudorandom numbers is generated using the linear congruential generator

$$x_{n+1} = (5x_n + 2) \bmod 9, \text{ with seed } x_0 = 3?$$