QUIZ 4

DISCRETE STRUCTURES | Marasigan, Vem Aiensi

1.) What are the quotient and remainder when

a.) 19 is divided by 7?

$a = b \times q + r$

$19 = 7 \times 2 + 5$ | quotient = 2 remainder = 5

b.) -111 is divided by 11?

$a = b \times q + r$

$-111 = 11 \times -11 + 10$ | quotient = -11 remainder = 10

c.) 789 is divided by 23

$a = b \times q + r$

$789 = 23 \times 34 + 7$ | quotient = 34 remainder = 7

2.) Convert the decimal expansion of each of these integers to a binary expansion.

d.) 231

2	231	
2	115	1
2	57	1
2	28	1
2	14	0
2	7	0
2	3	1
2	1	1
	0	1

Binary = 11100111

e.) 4532

2	4532	
2	2266	0
2	1133	0
2	566	1
2	283	0
2	141	1
2	70	1
2	35	0
2	17	1
2	8	1
2	4	0
2	2	0
2	1	0
	0	1

Binary = 1000110110100

f.) 97644

2	97644	
2	48,822	0
2	24,411	0
2	12,205	1
2	6,102	1
2	3,051	0
2	1,525	1
2	762	1
2	381	0
2	190	1
2	95	0
2	47	1
2	23	1
2	11	1
2	5	1
2	2	1
2	1	0
	0	1

Binary = 10111110101101100

3.) Use the Euclidean algorithm to find

g.) gcd(12, 18)

a	b	a mod b
12	18	12
18	12	6
12	6	0
6	0	

gcd(12, 18) = 6

h.) gcd(111, 201)

a	b	a mod b
111	201	111
201	111	90
111	90	21
90	21	6
21	6	3
6	3	0
3	0	

gcd(111, 201) = 3

i.) gcd(1001, 1331)

a	b	a mod b
1001	1331	1001
1331	1001	330
1001	330	11
330	11	0
11	0	

gcd(1001, 1331) = 11

4.) Show that 15 is an inverse of 7 modulo 26.

$a = 7 \quad b = 15 \quad m = 26$

$(7 \times 15) \% 26 = 105 \% 26$

$= 1$

Modulo of 105 to 26 is 1 therefore 15 is the inverse of 7 modulo 26