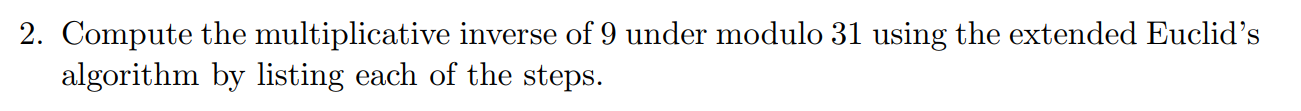
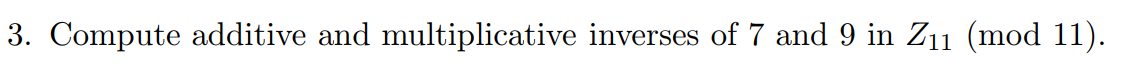
  
  
104 = 13(8) + 0;  
13  
  
  
31 = 9(3) + 4  
9 = 4(2) + 1  
4 = 1(4) + 0

---------------------

31 - 9(3) = 4  
9 - 4(2) = 1

---------------------

9 – 2(31-9(3)) = 1  
9 – 2(31 + 9(3)) = 1  
9 – 2(31) + 6(9) = 1  
7(9) – 2(31) = 1  
  
= 7

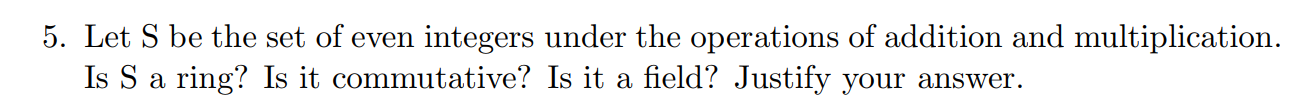
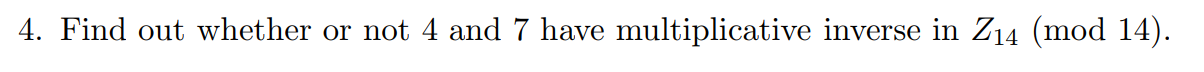
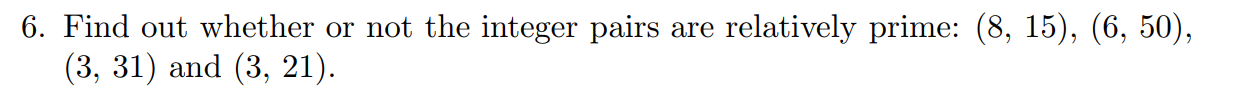
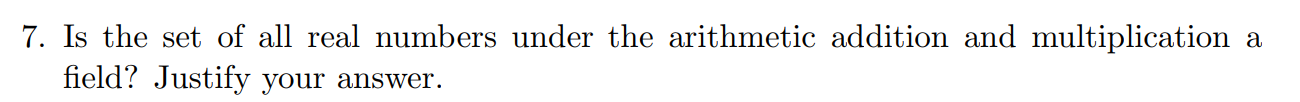
  
  
11-7 = 4 [additive inverse 7]  
  
11 = 7(1) + 4  
7 = 4(1) + 3  
4 = 3(1) + 1  
3 = 1(3) + 0  
----------------  
  
11 – 7(1) = 4  
7 - 4(1) = 3  
4 - 3(1) = 1  
----------------

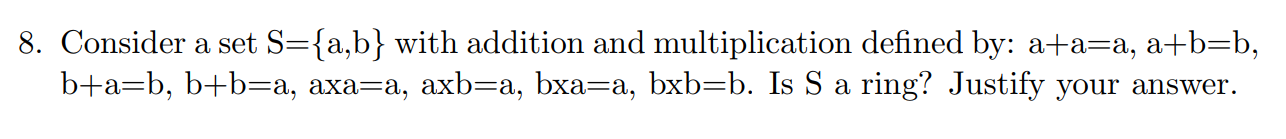
4 – (7-4(1)) = 1  
4(2) – 7 = 1  
2(11-7(1)) – 7 = 1  
11(2) – 7(2) – 7 = 1  
11(2) + (-3)7 = 1

= -3  
11 + -3   
8

Additive Inverse: 7 mod 11 == 4  
Multiplicative Inverse: 7 mod 11 == 8

Additive Inverse: 11-9 = 2  
  
11 = 9(1) + 2  
9(1) = 2(4) + 1  
2 = 1(2) + 0  
  
-------------------  
  
11 – 9(1) = 2  
9(1) – 2(4) = 1  
  
-------------------  
  
9(1) – 2(4) = 1  
9(1) – 4(11-9) = 1  
  
9(1) – 4(11) + 4(9) = 1  
5(9) – 4(11) = 1  
  
Additive Inverse: 9 mod 11 == 2  
Multiplicative inverse: 9 mod 11 == 5

  
   
No they are not relatively prime to each other.  
  
  
(A1) Closure:   
Yes  
(A2) Associative Law:  
Yes  
(A3) Identity Element  
Yes  
(A4) Additive Inverse:  
Yes  
(A5) Commutative Law:  
Yes  
  
(M1) Closure:  
Yes  
(M2) Associative Law:  
Yes  
(M3) Distributive Law:  
Yes  
(M4) Commutative Law:  
Yes  
(M5) Multiplicative Identity  
No  
  
It is a commutative ring.   
Not a field.  
  
  
  
[8 – 15] – Yes  
[6 – 50] – No  
[3 – 31] – Yes  
[3 – 21] - No   
  
  
A(1) – Closure  
Yes  
A(2) – Associative Law  
Yes  
A(3) – Identity Element (0)  
Yes  
A(4) – Additive Inverse  
Yes  
A(5) - Commutative Law  
M(1) – Closure  
M(2) – Associative Law  
Yes  
M(3) – Distributive Law  
Yes  
M(4) – Commutative Law  
Yes  
M(5) – Multiplicative identity (1)  
Yes  
M(6) - Non-Zero Divisors   
Yes  
M(7) – Multiplicative Inverse  
Yes  
  
It is a field.

  
A(1) – Closure   
Yes  
A(2) – Associative Law  
Yes  
A(3) – Identity Element (a)  
a + a = a  
a + b = b  
A(4) – Additive Inverse  
b + b = a  
a + a = a  
A(5) – Commutative Law  
Yes  
M(1) – Closure   
Yes  
M(2) – Associative Law  
Yes  
M(3) – Distributive Law  
Yes  
M(4) – Commutative  
Yes  
M(5) – Multiplicative Identity (itself)  
Yes  
a x a = a  
b x b = b  
  
Yes, it is a ring.