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1). Congruence is :

- ✓ Let a and b be integers and m be a positive integer.
  We say that a is ***congruence to b modulo m*** if m divides a-b.
- ✓ We use the notation a≡b(mod m) to indicate that a in congruence to b modulo m.
- ✓ In others words: a≡b(mod m) if and only if a mod m=b mod m.

2). Is it true that 108≡204(mod 3)? Why?

Since 108 mod 3 = 0
204 mod 3 =0
=>108 mod 3 = 204 mod 3 = 0
So 108 is congruence to 204 modulo 3.

3). Is it true that $85 \equiv 65\ (mod\ 15)$? Why?

Since 85 mod 15 = 10
65 mod 15 = 5
=>85 mod 15 = 10 ≠ 65 mod 15 = 5
So that 85 is not congruence to 65 modulo 15.

4) A={10,11,….,50} for which integer A that $A \equiv 7(mod\ 4)$?

But 7 mod 4 = 3
So the numbers congruence to 7 mod 4 are{11,15,19,23,27,31,35,39,43,47}

5) B={31,32,….,91} for which integer B that $B \equiv 10(mod\ 6)$?

But 10 mod 6 = 4
So the numbers congruence to 10 mod 6 are{34,40,46,52,58,64,70,76,82,88}

6). What is answer of (5BA7CD)16 to (?)10?

(5BA7CD)16=[5x16^5 + Bx16^4+Ax16^3+7x16^2+Cx16+Dx16^0]
=5x1048576+11x65536+10x4096+7x256+192+13
= $6006733_{10}$

7). What is anser of (2594)10 to(?)6?

2594=6x432 + 2
432=6x72 + 0
72=6x12 + 0
12=6x2 + 0
2=6x0 + 2
So that $(2594)_{10}=(20002)_6$