carry ons using algo „Addition of two integers"

3) If there's extra carry over 1, we add it back to the result

$5+(-3)=2$

$5 \to 0101$

$-3 \to 1100$

~~1001~~ ~~1100~~ ~~0101~~

$$\begin{array}{r} 0101 \\ +\,1100 \\ \hline ①0001 \end{array} \to 0001 = 2.$$

㊸

To get sum of two complement's representation of the sum of two integers → we need them in binary format and add them together and ignore any carry over.

# Home Work N17

4.2

⑦

a) $(80E)_{16} \rightarrow (2062)_{10} \rightarrow (1000\ 0000\ 1110)_2$

b) $(135AB)_{16} \rightarrow (79275)_{10} \rightarrow (1001\ 1010\ 1101\ 01011)_2$

c) $(ABBA)_{16} \rightarrow (7071)_{10} \rightarrow (1010\ 1011\ 1011\ 1010)_2$

d) $(DEFACED)_{16} \rightarrow (233811181)_{10} \rightarrow$

$\rightarrow (1101\ 1110\ 1111\ 1010\ 1100\ 1110\ 1101)_2$

⑲

1) Octal → binary → hexadecimal

2) hexadecimal → binary → octal

㉗

$3^{2003} \bmod 99$

~~$(13)_{10}$~~ [illegible] $\rightarrow b = 3;\ n = 99;\ m = 2003$

$(2003)_{10} = (\overset{10}{1}\overset{9}{1}\overset{8}{1}\overset{7}{1}\ \overset{6}{1}\overset{5}{0}\overset{4}{1}\overset{3}{0}\ \overset{2}{0}\overset{1}{1}\overset{0}{1})_2$

1) $3^1 \bmod 99 \rightarrow 3$

2) $3^2 \bmod 99 \rightarrow 9$

3) $3^4 \bmod 99 \rightarrow 9 \times 9 \rightarrow \underline{81}$

4) $3^8 \bmod 99 \rightarrow 81 \times 81 \rightarrow 6561 \bmod 99 \rightarrow 63$

---

5) $3^{16}$ mod 99

6) $3^{32}$ mod 99 →

⋮

11) $3^{1024}$ mo

$\underline{1} \cdot \overset{0}{3} = 3 \cdot$

~~$27 \cdot 81 = 2$~~

~~$18 \cdot 63 = 1$~~

$\overset{2}{27} \cdot 36 =$

$\overset{3}{81} \cdot 81 =$

$\overset{4}{27} \cdot 27 =$

$\overset{5}{36} \cdot 36 =$

$\overset{6}{9} \cdot 9 = 8$

$\overset{7}{81} \cdot 81 =$

$3^{2003}$

㊲

1) We

bina

2)

0 1110)$_2$

101 01011)$_2$

1010)$_2$

63

---

5) $3^{16}$ mod 99 → 63 × 63 → 3969 mod 99 → 0

6) $3^{32}$ mod 99 → 0

⋮

11) $3^{1024}$ mod 99 → 0

$1 \cdot \overset{0}{3} = 3 \cdot \overset{1}{9} = 27$ mod ~~27~~ 99 = 27

~~27·81 = 2187 mod 99 = 18~~

~~18·63 = 1134 mod 99 = 27~~

$\overset{2}{27} \cdot 36 = 972$ mod 99 = 81

$\overset{3}{81} \cdot 81 = 6561$ mod 99 = 27

$\overset{4}{27} \cdot 27 = 729$ mod 99 = 36

$\overset{5}{36} \cdot 36 = 1296$ mod 99 = 9

$\overset{6}{9} \cdot 9 = 81$ mod 99 = 81

$\overset{7}{81} \cdot 81 = 6561$ mod 99 = 27

$3^{2003}$ mod 99 = 27

㊲

1) We need to turn regular integers (decimal) into binary format

2) then we add them together regularly with