History of Math	Homework 0	Karan Amin

1

$100_{10} = 1100100_2$

$100_{10} = 10201_3$

$100_{10} = 1210_4$

$100_{10} = 400_5$

$100_{10} = 244_6$

$100_{10} = 202_7$

$100_{10} = 144_8$

$100_{10} = 121_9$

$100_{10} = 100_{10}$

$100_{10} = 91_{11}$

$100_{10} = 84_{12}$

2

$101 \cdot 97$

$101 = (1, 0, 1)$

$97 = (1, 0, -3)$

$$\begin{array}{cccc} & 1 & 0 & 1 \\ & 1 & 0 & -3 \\ \hline & -3 & 0 & -3 \\ 1 & 0 & 1 & 0 & 0 \\ \hline 1 & 0 & -2 & 0 & -3 \end{array} = \boxed{9797}$$

$1 \times 10^4 - 2 * 10^2 - 3 = 9797$

3

$26_{10} = 222_3 = (1, 0, 0, -1)$

$80_{10} = 2222_3 = (1, 0, 0, 0, -1)$

$$\begin{array}{ccccccc} & & 1 & 0 & 0 & 0 & -1 \\ & & & 1 & 0 & 0 & -1 \\ \hline & -1 & 0 & 0 & 0 & 1 \\ 1 & 0 & 0 & -1 & 0 & 0 & 0 \\ \hline 1 & 0 & 0 & -1 & -1 & 0 & 0 & 1 \end{array}$$

$1 \cdot 3^7 - 1 \cdot 3^4 - 1 \cdot 3^3 + 1 \cdot 3^0 = \boxed{2212001_3} = 2080_{10}$

4

$1_{10} = 1_3$

$2_{10} = 2_3$

$3_{10} = 10_3$

$4_{10} = 11_3$

$5_{10} = 12_3$

$6_{10} = 20_3$

$7_{10} = 21_3$

$8_{10} = 22_3$

$9_{10} = 100_3$

$10_{10} = 101_3$

$11_{10} = 102_3$

$12_{10} = 110_3$

$13_{10} = 111_3$

$14_{10} = 112_3$

$15_{10} = 120_3$

$16_{10} = 121_3$

$17_{10} = 122_3$

$18_{10} = 200_3$

$19_{10} = 201_3$

$20_{10} = 202_3$

$21_{10} = 210_3$

$22_{10} = 211_3$

$23_{10} = 212_3$

$24_{10} = 220_3$

$25_{10} = 221_3$

$26_{10} = 222_3$

1	4	7
10	13	16
19	22	25

2	5	8
11	14	17
20	23	26

3	4	5
12	13	14
21	22	23

6	7	8
15	16	17
24	25	26

9	10	11
12	13	14
15	16	17

18	19	20
21	22	23
24	25	26

Answer