Exercice 7

1) 2002

$$\begin{array}{r|l} 2002 & 2 \\ 0 & 1001 \end{array} \quad \begin{array}{r|l} 1001 & 2 \\ 1 & 500 \end{array} \quad \begin{array}{r|l} 500 & 2 \\ 0 & 250 \end{array} \quad \begin{array}{r|l} 250 & 2 \\ 0 & 125 \end{array} \quad \begin{array}{r|l} 125 & 2 \\ 1 & 62 \end{array} \quad \begin{array}{r|l} 62 & 2 \\ 0 & 31 \end{array}$$

$$\begin{array}{r|l} 31 & 2 \\ 1 & 15 \end{array} \quad \begin{array}{r|l} 15 & 2 \\ 1 & 7 \end{array} \quad \begin{array}{r|l} 7 & 2 \\ 1 & 3 \end{array} \quad \begin{array}{r|l} 3 & 2 \\ 1 & 1 \end{array}$$

$2002_{10} = 11111010010_2$

$1001_{10} = 1111101001_2$

```
  11111010010
+ 01111101001
 ------------
  10000111011
  0 1 2 3 4 5 6 7 8 9 10
```

0: 1

1: 1 + 0 = 1

2: 1 + 0 + 0 = 1

3: 1

4: 1

5: 1 + 0 + 0 + 0 + 0 + 1 = 0

6: 1 + 0 + 0 + 0 + 0 + 1 + 1 = 1

7: 1 + 0 + 0 + 0 + 0 + 1 + 1 + 1 = 0

8: 0

9: 1 + 0 + 0 + 0 + 0 + 1 + 1 + 1 + 0 + 1 = 1

10: 1 + 0 + 0 + 0 + 0 + 1 + 1 + 1 + 0 + 1 + 1 = 0

10 9 8 7 6 5 4 3 2 1 0

1 1 1 1 1 0 1 0 0 1 0$_2$ = 1024 + 512 + 256 + 128 + 64 + 16 + ~~8 + 4~~ + 2 = 1536 + 384 + ~~80~~ 82 + ~~4~~ = 1920 + ~~82~~ = ~~2014~~ 2002$_{10}$

Ответ: 10000111011

2) 323

323 | 2
1 | 161 | 2
1 | 80 | 2
0 | 40 | 2
0 | 20 | 2
0 | 10 | 2
0 | 5 | 2
1 | 2 | 2
0 | 1

323_{10} = 101000011$_2$

161_{10} = 10100001$_2$

$$
\begin{array}{r}
10100\,0011 \\
01010\,0001 \\
\hline
11110\,0010 \\
\scriptstyle 0\,1\,2\,3\,4\;\;5\,6\,7\,8
\end{array}
$$

0: 1

1: 1 + 1 = 0

2: 1 + 1 + 1 = 1

3: 1 + 1 + 1 + 1 = 0

4: 0

5: 0

6: 0

7: 1 + 1 + 1 + 1 + 0 + 0 + 0 + 1 = 1

8: 1

$\overset{8\,7\,6\,5\,4\,3\,2\,1\,0}{1\,0\,1\,0\,0\,0\,0\,1\,1_2} = 256 + 64 + 2 + 1 =$

$= 320 + 3 = 323_{10}$

Ombemi: 11110010.

3) 20 + 09 = 29

$$\begin{array}{r|l} 29 & 2 \\ \hline 1 & 14 \\ & \hline & 0 \end{array} \quad \begin{array}{r|l} 14 & 2 \\ \hline 7 & \\ \hline 1 & \end{array} \quad \begin{array}{r|l} 7 & 2 \\ \hline 3 & \\ \hline 1 & \end{array} \quad \begin{array}{r|l} 3 & 2 \\ \hline 1 & 1 \end{array}$$

$29_{10} = 11101_2$

$14_{10} = 1110_2$

$$\begin{array}{r} 11101 \\ +\ 01110 \\ \hline 10011 \\ 01234 \end{array}$$

0: 1

1: 1

2: 1

3: 1 + 0 + 0 + 1 = 0

4: 1 + 0 + 0 + 1 + 1 = 1

$4\ 3\ 2\ 1\ 0$

$11101_2 = 16 + 8 + 4 + 1 = 24 + 5 =$

$= 29_{10}$

Ответ: 10011

4) 1

1	2
1	0

$1_{10} = 01_2$

$0_{10} = 0_2$

$$\begin{array}{r} 01 \\ +00 \\ \hline 01 \\ 01 \end{array}$$

0 : 0

1 : 1

$$01_2 = 1_{10}$$

Ombeni: 01